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Rethinking the Political Economy of Decentralization: How Elections and Parties Shape the Provision of Local Public Goods

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We investigate which political institutions will improve the delivery of public goods in decentralized systems. We begin with a formal extension of Oates' influential "decentralization theorem" to include the presence of inter-jurisdictional spillovers. Our new model, which we term the "strong decentralization theorem," indicates that, when spillovers are present, the impact of decentralization will depend on the structure of a country's political system. More specifically, our model suggests that the interaction of democratic decentralization (the presence of popularly elected sub-national governments) and party centralization (the power of national party leaders over sub-national office-seekers) will produce the best outcomes. To test this argument empirically, we develop a new dataset of sub-national political institutions. Our analyses, which examine educational and health service delivery in 135 countries across 30 years, provide support for our theoretical expectations. (JEL D61, D72, D78, H73, H75)

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1. *Introduction*

As more and more of the world's states devolve power and resources to sub-national governments, decentralization has emerged as one of the most important global trends of the new century. Yet there is still no consensus concerning the benefits of decentralization and how to design institutions that can realize these benefits. In this paper, we investigate the political conditions under which this trend towards decentralization will improve the delivery of public goods. We begin by incorporating insights from political science and economics into a rigorous and formal extension of the “decentralization theorem.” This theorem, which points to the efficiency benefits of the sub-national provision of public goods, was first developed by Oates (1972) and has influenced virtually all of the literature over the past four decades.

In his theorem, Oates assumes, among other things, the absence of inter-jurisdictional spillovers in the centralized provision of local public goods. Our extension goes beyond Oates by producing a “strong decentralization theorem” that identifies the political conditions under which the provision of local public goods by a system of sub-national governments is welfare superior to centralized provision even under spillovers of local public spending. More specifically, it finds that these beneficial outcomes for public service delivery will hold when democratic decentralization (i.e. the creation of popularly elected sub-national governments) is combined with party centralization (i.e. the power of national party leaders to nominate candidates for sub-national office). Democratic decentralization creates the accountability necessary for efficient public goods provision, while party centralization increases local governments' incentives to provide the optimal levels of public goods with spillover effects. In summary, our theory shows that political institutions may matter considerably in determining the efficiency of decentralization outcomes.

To test these arguments empirically, we make use of a new dataset of sub-national political institutions created for this project. Up to this point, scholars interested in sub-national political institutions have been forced to focus on single cases (especially the United States) or to assume that national-level political institutions are replicated at the sub-national level. Our new dataset allows us to examine how the structure of sub-national political institutions influences educational and health outcomes (our proxies for public goods

provision) in 135 countries across 30 years. This empirical analysis, to our knowledge the broadest quantitative exploration of sub-national politics in the literature, provides solid support for our theoretical expectations.

This paper demonstrates for the first time that the decentralization theorem, which lies at the heart of our understanding of sub-national government, is dependent on the structure of political institutions once the unrealistic assumption of no inter-jurisdictional spillovers is relaxed. Local elections and certain forms of party institutions must be in place before we can expect decentralization to deliver on its promises. This finding has very significant implications for the scholarly understanding of decentralization among both economists and political scientists. It helps make sense of the mixed findings that characterize the empirical scholarship on decentralization while adding clarity and detail to the theoretical literature. And, for development practitioners, it has the potential to encourage a deeper examination of the types of political institutions that may be necessary for decentralization reforms to produce fuller results.

The rest of the paper is organized as follows. Section two reviews the pertinent literature. Section three discusses the basic intuition behind our analysis. Section four develops the formal theoretical model and results. Section five presents our empirical analysis and our results. Section six concludes.

2. *Review of the Literature*

As noted above, decentralization has become a prominent global trend; countries which have engaged in decentralization reforms include China, Indonesia, South Africa, India, the United Kingdom, and many others. These reforms, at least in the developing world, have been supported both by the aid dollars of multilateral and bilateral agencies such as the World Bank and USAID, and by the research findings of many scholars. Central to these positive scholarly judgments is the “decentralization theorem,” which was developed by Oates (1972) and states that “. . . in the absence of cost-savings from the centralized provision of a (local public) good and of inter-jurisdictional externalities, the level of welfare will always be at least as high (and typically higher) if Pareto-efficient levels of consumption are provided in each jurisdiction than if any single, uniform level of consumption is maintained across all jurisdictions”(p.54).

As the process of decentralization has continued apace, however, some scholars have begun to question whether devolving authority to regional and local governments is a universal good. Among other things, they have pointed out that Oates, in developing his theorem, assumed a benevolent, welfare-maximizing government. While this assumption may have been useful for creating a simple and elegant theory of decentralization, it hardly accords with empirical realities. More to the point, it begs the question of how different political processes and institutions might shape the fiscal choices made by policy makers. While these problems have been increasingly acknowledged and confronted in the “second generation” research on decentralization, there is still little systematic work on which political institutions lead to the social welfare gains expected of decentralization by Oates (1972).² Instead, this second generation of scholarship, which relaxes the assumption of benevolent government, has tended to focus on the problems of assignment and soft budget constraints rather than on the relationship between specific political institutions and the provision of local public goods.

We begin our exploration of the existing literature with an examination of what economists and political scientists (sometimes on parallel tracks) have said about decentralization and its efficiency implications. We then move to the broader literature on political institutions, party organization, and public goods provision, nearly all of which has developed with reference to national governments and apart from the study of decentralization. We conclude our review of the literature by highlighting the relative absence of work that considers how specific political institutions such as electoral rules and local representation might mediate the effects of decentralization on efficiency outcomes.

Modern research on decentralization began with Tiebout’s landmark 1956 study, which argued that a decentralized system of public service delivery can maximize efficiency by allowing government services to vary according to the preferences of citizens in different jurisdictions. Oates picked up on this idea and qualified it in his 1972 formulation of the decentralization theorem, and scholars have since spent significant time improving or critiquing his argument and testing its empirical merit. For example, Breton (2002),

² For more on second generation research on fiscal federalism, see Weingast (2014), Weingast (2009), and Oates (2005).

Treisman (2007), Lockwood (2002), and Besley and Coate (2003) have examined whether central governments could themselves target public goods delivery to regional preferences, while Bardhan (2002) and Manor (1999) are skeptical that individuals will move to regions that provide the policies they prefer. Others assert that decentralization increases opportunities for corruption (Treisman 2000, 2007; Tanzi 2002) and can be counter-productive if sub-national civil servants are not sufficiently professionalized (Shah 2003, Manor 1999).

Another group of economists (e.g. Weingast 1995) emphasizes the utility of decentralization because it generates a healthy competition among jurisdictions. Those that are most efficient at public goods delivery will attract new citizens, they argue, whereas those that govern poorly will find their populations and tax bases shriveled. Of course, like the arguments made by Tiebout and Oates, this contention has attracted its share of critics, especially among those who fear that decentralization could produce an inequitable distribution of goods (Prud'Homme 1995), exacerbate regional enmities (Treisman 1999, von Braun and Grote 2002), or lead to local elite capture (Bardhan and Mookherjee, 2000). Many scholars are also concerned about the possible negative impact of decentralization for a country's fiscal balances. For example, Treisman (2000) and Wibbels (2000) find an empirical connection between federalism and inflation.

Despite the critics, most scholarship in economics and political science, following in the tradition of Tiebout, Oates, and Weingast, has viewed decentralization positively. For example, many scholars believe that decentralization has a salutary effect on corruption by promoting transparency and accountability (Manor 1999, Gurgur and Shah 2002, Crook 2003). Others have highlighted ways in which some of the potential drawbacks of decentralization can be alleviated. For example, Rodden (2006) recommends that central governments follow a no-bailout policy without respect to sub-national authorities, thereby forcing them to internalize the consequences of their fiscal behavior.

On the empirical side, evidence for the proposed link between decentralization and efficiency has been mixed. Among the skeptics, Davoodi and Zou (1998) believe that devolving power to sub-national governments slows economic growth in developing countries, Parry (1997) is skeptical that decentralization in Chile has improved educational outcomes, and, more recently, Malesky, Nguyen, and Tran (2014) find that

public service provision mostly improved after the abolition of district-level representative councils in Vietnam. On the positive side, Lewis (1998) associates improved water delivery with decentralization in Kenya and Habibi et al. (2003) point to evidence that strong sub-national government reduced infant mortality in Argentina. Studies of Bolivia (Faguet and Sanchez 2008), Argentina (Habibi et al. 2003), and Indonesia (Simatupang 2009), as well as cross-national quantitative analyses (Heredia 2006), also point to improved educational outcomes with decentralization.

A reasonable summary, then, is that most scholars continue to see decentralization as a route to improving the delivery of public goods, but with a number of significant caveats (see Hankla 2009). If the benefits of decentralization are indeed conditional on other factors, something that many scholars are beginning to suspect, it could help account for the mixed empirical findings outlined above. Thus far, however, the literature has spent little time considering how political institutions might matter in mediating the effects of devolving power to sub-national governments. To lay the groundwork for incorporating these institutions into our argument, we turn now to a consideration of the broader literature on institutions and governance in political science.

Political scientists have long investigated the implications of different institutional configurations for the delivery of public goods, although their efforts have focused almost exclusively on national governments. Most scholars in this area agree, at least implicitly, that the political institutions likely to produce positive outcomes are those which expose leaders to popular democratic pressures while insulating them from particularistic interest groups. In making variations of this broad argument, researchers have investigated the impact of a number of specific institutions (e.g., electoral systems, legislative-executive relations, legislative and coalition party fragmentation) on a wide variety of policy outcomes (e.g., free trade, balanced budgets, energy conservation). To take some examples, political scientists have found evidence that strong, democratic executives are more likely to provide public goods such as free trade (O'Halloran 1994, Nielson 2003), economic liberalization (Haggard and Kaufman 1995), and balanced budgets (Hallerberg and Marier 2004) than their less insulated counterparts. In addition, many scholars have associated balanced budgets with low levels

of legislative and governmental party fragmentation (e.g. Roubini and Sachs 1989, Volkerink and de Haan 2001).

The impact of political party organization on policy outcomes, one of the central concerns of this article, has been much less thoroughly explored in the literature. The little research that has considered party organization has linked a more centralized structure (with empowered national elites) to public goods provision. Hankla (2006) and Nielson (2003), for example, argue that democracies with centralized political parties are more likely to adopt free trade policies, and Hallerberg and Marier (2004) find a connection between centralized parties and balanced budgets in Latin America. Similarly, Hicken and Simmons (2008) argue that that education spending undertaken by decentralized parties is more particularistic and less effective. The link is simply that party centralization shifts power from local elites, who might be tempted to shore-up their support with particularistic goods, to national party leaders, who have electoral incentives to consider the aggregate national interest.

While nearly all of the research relating party structures with public goods delivery concerns the national level, some scholars have investigated the causal relationship between party and party system centralization on the one hand and the empowerment of sub-national governments on the other. For example, Chhibber and Kollman (2004) make the case that countries devolving more powers to the subnational level are likely to have more localized party systems, while Fabre et al. (2005) find that such countries will also be characterized by more decentralized parties. Garman, Haggard, and Willis (2001) argue for the same relationship moving in the opposite direction; for them the decentralization of parties is likely to drive greater fiscal decentralization. By contrast, Eaton (2004) and Dickovick (2011) find that the choice to empower sub-national governments can be driven by the incentives of national party leaders.

Other scholars have addressed the question of whether and how party structures can contribute to (or undermine) the stability of federalism. Undoubtedly William Riker is the most prominent scholar to have taken up this question, arguing in his classic 1964 book that party centralization is among the most important determinants of federal centralization as a whole. Extending that argument to the United States, Riker contends

in his 1987 book that the American “decentralized party system is the main protector of the integrity of states in our federalism” (p. 221).³ By contrast, Filippov, Ordeshook, and Shvetsova (2004) emphasize the benefits of more integrated parties, making the case that party systems which successfully link the national and sub-national levels of government are the best guarantors of a stable federal system. Myerson (2006) concurs, arguing that regional and local elections provide opportunities for potential national candidates to prove themselves at the sub-national level.

While all of these scholars have improved our understanding of how partisan and sub-national institutions interact, their focus has not been on connecting particular sub-national political institutions with public goods provision. Indeed, there are very few systematic studies in the literature that make this connection, but it is worth highlighting four influential analyses here. First, Riker, in his 1964 study, suggests that decentralized parties could be both a driver of democratic decentralization and a protector of the benefits of federalism. Second, Erik Wibbels argues in his 2005 book that the presence of centralized parties facilitates the efforts of national leaders to push sub-national governments into market reforms. Third, Hecock (2006) finds a positive relationship between sub-national political competition and educational spending in Mexico. Finally, and perhaps most related to our own work, Enikolopov and Zhuravskaya (2007) conclude, after a cross-national empirical study, that devolving fiscal authority to sub-national governments is more likely to improve public goods (in this case, education) delivery when parties are centralized.

Despite some overlap with our interests here, however, there are a number of significant differences between our argument and those set forth by these scholars. Turning first to Riker, he is primarily concerned with the causal relationship between party and democratic decentralization, rather than with the combinations of the two that would best generate public goods. Wibbels (2005), for his part, focuses on party centralization as a means of national control within a decentralized political system, and not on the incentives such structures create for internalizing externalities. In a similar vein, Hecock (2006) is more interested in the level of partisan competition than in the questions of party organization that we study here.

³ See also Volden 2004 for an excellent summary of Riker’s thought on Federalism.

Moreover, in contrast to Enikolopov and Zhuravshaya's important and well-executed 2007 study, we consider here the interaction between party centralization and democratic decentralization rather than that between party centralization and fiscal decentralization, and so our theory is significantly different. To be more specific, Enikolopov and Zhuravshaya do not consider, as we do, whether sub-national governments are elected, but focus instead on whether they are fiscally empowered. This is certainly an important factor, but previous work has indicated that the accountability that comes with democratic elections is very likely necessary to improve governance outcomes (i.e. Manor 1999). For that reason, we choose to examine the significant cross-national variation in sub-national democracy that exists in the world, making the assumption that democratically decentralized governments are also fiscally decentralized.⁴ Further, as we discuss below, our empirical section directly operationalizes the concept of democratic decentralization and provides a clear test for our specific arguments.

Another, perhaps more important, difference between our paper and that of Enikolopov and Zhuravshaya (2007) is that we develop our argument formally using the decentralization theorem as a base, an approach which gives us more opportunity to leave our mark on the fundamental theory of decentralization. To the best of our knowledge, we are the first to identify formally the precise political conditions under which the decentralization theorem, which has been at the center of research in fiscal federalism for decades, should hold.

On the empirical side, we believe that our dataset, which measures party decentralization more directly and at the sub-national level, hews more closely to theory. Enikolopov and Zhuravshaya do not observe political centralization directly but rather use two proxies: *i*) the age of the main parties (the older the more centralized), and *ii*) the fractionalization of the party system (the higher the less centralized). While these proxies were undoubtedly the best indicators available to them at the time, they are quite problematic. There is little reason to believe, for example, that party age should correlate closely to party centralization. Party centralization is largely a function of a country's specific political institutions, including its electoral system, its

⁴ The reverse case – that fiscally decentralized systems are generally democratically decentralized – is not likely to hold, as the prominent contemporary cases of Vietnam and China clearly show.

degree of federalism, and its candidate nomination procedures, rather than a result of its political development. For instance, many scholars, beginning with Riker in 1964, have classified America's two major parties as decentralized because of their lack of party unity at the national level and because primaries determine their nomination decisions. These parties are, of course, among the oldest in the world. By contrast, many new democracies have centralized parties that are dominated by a highly charismatic leader.

A country's party system fractionalization, its effective number of parties, is also a problematic proxy for its party centralization. The reason is that fractionalization is measured at the *party system* level, not the party level. It is entirely possible, and indeed common, for decentralized parties to form a low fractionalized party system, and for centralized parties to join together in a highly fractionalized party system. The United States is an example of the first contrary case, while Mexico, the Netherlands, and many other countries fall into the second. As a result, it is clear that a higher number of effective parties does not necessarily lead to more decentralized parties, as Enikolopov and Zhuravshaya assume. Our new dataset, which measures party (de)centralization using the power of national party leaders to nominate candidates for sub-national office, is coded at the sub-national party level and therefore represents a much more direct measure of the underlying concepts.⁵

To summarize, then, the purpose of our research is to merge insights from political science with the decentralization literature outlined above, all to identify the political conditions needed for realizing the benefits of decentralization. We turn to developing our theory in the next section.

3 *Theoretical Framework and Basic Intuition*

In developing our theory, we begin with the decentralization theorem (Oates 1972) and expand it formally by relaxing the assumption of no inter-jurisdictional spillovers and then addressing the implications of

⁵ Empirically, we also improve on Enikolopov and Zhuravshaya's work by using control variables for political institutions at the sub-national level and educational indicators for the dependent variables that pick-up more directly on educational outcomes.

different institutional configurations for its efficiency predictions. More specifically, we consider four distinct cases:

- (1) countries that are **democratically decentralized** (i.e. they have democratically elected sub-national governments) and **party decentralized** (i.e. national leaders lack the power to select candidates for these sub-national elections);
- (2) countries that are **democratically centralized** (i.e. they have no elected sub-national governments) but **party decentralized** (i.e. national leaders lack the power to nominate candidates for constituency elections to the national legislature);
- (3) countries that are **democratically decentralized** (i.e. they have elected sub-national governments) but **party centralized** (i.e. national party leaders select candidates for sub-national elections); and
- (4) countries that are **democratically centralized** (i.e. they have no elected sub-national governments) and **party centralized** (i.e. national party leaders nominate candidates to constituency elections for the national legislature).

Our notion of what constitutes a centralized party is the same regardless of the electoral system used in a country. For us, a party is centralized when its national party leaders control access to the party name in local elections. For space reasons, we focus our formal analysis in this paper on majoritarian, single-member-district systems, defining decentralized parties as those that hold open or closed primaries (modeled separately) to choose candidates, as opposed to those having national party leaders nominate them. While we understand that many decentralized parties practice free candidate nomination procedures (i.e. by collecting signatures or paying a fee) rather than primaries, we believe these decentralized structures will have many of the same effects as primaries (see Carey and Shugart 1995).

In a related paper, we also develop a formal model examining the same relationships for democracies that use proportional representation (PR) systems (Ponce-Rodriguez et al. 2015). While the underlying structure of this model is the same as that presented here, our purpose was to ensure that the unique party

structures that different electoral systems can incentivize have no impact on our hypothesized relationships. In our PR model, we define decentralized parties as those that use open lists, a variant of PR that allows voters to select the individual candidates that they prefer. We model centralized parties, on the other hand, as those using closed lists. Within open list systems, we also consider the effect of more versus less central party involvement in selecting candidates, which allows us to make more fine distinctions in the level of centralization that we model.

In our models, we extend the decentralization theorem by incorporating inter-jurisdictional spillovers, which as mentioned above were explicitly excluded by Oates, and find that the benefits of decentralization continue to hold provided that democratic decentralization is combined with party centralization. We call this our “strong decentralization theorem.”

To be more specific, in the majoritarian system models that are our focus here, both the conventional decentralization theorem (which assumes away spillovers) and the strong decentralization theorem hold when parties are centralized. Under these circumstances, local public goods allocation will be more efficient when provided by a system of elected local governments, even in the presence of spillover effects. When parties are decentralized, however, the delivery of public goods by local governments is only consistently better when there are no externalities. In other words, the strong decentralization theorem does not generally hold for democracies with party decentralization because primary elections do not create incentives for local politicians to internalize inter-jurisdictional spillovers. Again, party centralization in this context is measured as central party nomination of candidates, while party decentralization is measured as the presence of primaries.⁶

Our proportional system model, detailed in Ponce-Rodriguez et al. (2015), obtains nearly identical findings. In democracies using closed list systems, our measure of party centralization, both the standard and the strong decentralization theorems hold. In these cases, the creation of local elected local governments will

⁶ Note, however, that we do find that the conventional decentralization theorem (which assumes away spillovers) holds if there is democratic decentralization and party decentralization with open primaries. For the case of a country with democratic decentralization and party decentralization with closed primaries the conventional decentralization theorem does not hold.

improve local public goods delivery, even when there are spillover effects. This is also the case in more centralized forms of open list systems. By contrast, in countries where decentralized forms of open list systems are used, only the conventional decentralization theorem will hold. Any improvement in public goods delivery that may come from the creation of local government will depend on whether externalities are present.

The intuition of these models is, first, that democratic decentralization, by increasing both accountability and access to local information, produces incentives on the part of politicians to provide citizens with the bundle of public goods that they desire. In other words, as Tiebout (1956) and Oates (1972) point out, polities with elected sub-national governments can better target public services to the needs and preferences of their constituents, allowing bundles of goods to vary across constituency. Of course, having these governments democratically elected is the key to ensuring that they are responsive to citizen desires (Bird and Vaillancourt 1998, Manor 1999).

Second, party centralization has the contrasting benefit of increasing the chances that any externalities from local public goods will be internalized. A common concern about democratic and fiscal decentralization is that local governments will under-provide public goods with beneficial spillovers beyond their constituencies (e.g., Bird et al. 2003). This is because these governments are unable to internalize and profit from the political rewards of providing these goods optimally. The “rational” policy is instead to ignore the benefits that arise in other jurisdictions and/or to free-ride on the expenditures of neighboring governments; in either case the production of public goods will not be optimal. A number of basic public services, such as primary health, general education, water treatment and environmental protection, are likely to generate spillover effects and may not receive sufficient financing from local governments.⁷

When parties are centralized, however, sub-national elected leaders do have incentives to provide more public goods with benefits that spillover into neighboring constituencies. National party leaders will be interested in generating optimal levels of public goods with spillover effects because they are concerned with

⁷ In the theory and practice of fiscal federalism, these externalities justify the use of conditional grants from the central to subnational governments.

their party's prospects in the country as a whole. In centralized parties, these national leaders have significant powers, not least nomination powers over sub-national politicians, and therefore can push them to optimally supply these goods.

To summarize, sub-national leaders in systems with democratic decentralization and party centralization have two masters whose interests are sometimes in competition, namely party chiefs in the national capital and local voters in their constituencies. Without the former, these leaders cannot be nominated and without the latter they cannot be elected. These competing loyalties produce incentives both to provide differentiated local public goods and to spend more money on goods with spillover effects. As a result, our argument is that systems that mix democratic decentralization with party centralization will have the best outcomes from the perspective of the optimal supply of local public goods, other things equal. Systems that are centralized in both ways lack sufficient incentives to differentiate and target goods to local preferences, and systems that are decentralized in both dimensions have little incentive to generate optimal levels of public goods with geographical externalities.

A final question is whether countries that mix centralization and decentralization in the reverse way, those with no locally elected governments but with decentralized parties, might be able to produce the same beneficial tension. We think not. Even if politicians elected to the national legislature from local districts have incentives to concern themselves with local preferences, their ability to force the central government to differentiate tax and spending bundles for their constituents will be limited. Moreover, theoretical models developed by Lockwood (2002) and Besley and Coate (2003) indicate that, while central governments may provide different constituencies with different bundles of public goods, a more decentralized approach to decision-making is likely to produce more efficient differentiation.

4 *The Formal Model*

In this section, we present our formal expansion of the decentralization theorem, focusing on democracies using majoritarian electoral systems. As noted above, we have also modeled similar relationships

for PR systems, which, for space reasons, we present only in Ponce-Rodriguez et al. (2015). In essence, however, the logic of the theory, as noted above, is the same for both systems, as is the basic intuition of what constitutes a centralized party. Whether a democracy uses a majoritarian or a proportional electoral system, we consider that country's parties to be centralized when national party leaders control nominations to local office.

In presenting our formal model, we take a sequential approach: first, we develop a comparative analysis of the welfare properties of the democratically (de)centralized provision of local public goods for economies with *party centralization*. To do so, we provide two models of electoral competition with party centralization: the first model considers that local public goods are provided by a central government. In the second model local public goods are supplied by a system of local governments.⁸ This comparative analysis leads to one of our main theoretical findings: the “strong decentralization theorem” which identifies conditions in which a system of local governments welfare-dominates the provision of local public goods (relative the fiscally centralized provision) even if local public goods show inter-jurisdictional spillovers.

Second, we also develop a comparative analysis of the welfare properties of the democratically (de)centralized provision of local public goods for economies with *party decentralization*. Again, we develop two models of electoral competition with party decentralization: in the first model local public goods are centrally provided while the second model considers decentralization. This comparative analysis shows that the strong decentralization theorem does not hold for economies with party decentralized systems. However, we also show that the conventional decentralization theorem (as identified originally by Oates 1972) holds for economies with decentralized party systems that use open primaries but fails to hold for decentralized party systems that use closed primaries.

4.1 *The Benchmark and Definitions*

⁸ Note that we assume here that the provision of local public goods by non-elected local governments (i.e. governments that are deconcentrated but not democratically decentralized) are equivalent to their being provided by the central government.

We begin by characterizing the set of local public goods that maximize aggregate public goods surplus. This will provide us with a metric for the comparative analysis of the welfare properties of the centralized and decentralized provision of local public goods. This approach to benchmarking our results allows us to compare them to those in the normative analysis of Oates (1972) and the more recent political economy analyses of Besley and Coate (2003) and Lookwood (2008).

Consider an economy composed of districts i and $-i$ with $n^i = 1, 2, \dots, N$ individuals in each district. Individuals do not have mobility across jurisdictions. The preferences of an individual with an endowment e^i in district i is $v^i(e^i, G^i) = \text{Max } \mu^i(x^i, g^i, g^{-i}) = x^i G^i$ subject to a) $x^i = e^i - t^i$ and b) $g^i = N t^i \forall i$, where $v^i(e^i, G^i)$ is the individual's indirect utility, $\mu^i(x^i, g^i, g^{-i})$ are his preferences over a private good x^i , $G^i = (g^i + k^{-i} g^{-i})$ is the overall consumption of local public goods provided by district i , g^i , and by district $-i$, g^{-i} , and t^i is a head tax on residents of district i

The parameter $k^{-i} \in [0, 1] \forall -i, i$, measures the extent of inter-regional spillovers of g^{-i} over residents of district i . For local public goods without spillovers $k^{-i} = 0 \forall -i, i$, and $k^{-i} = 1$ when local spending in district $-i$ is over a nationwide pure public good. Condition (a) is the individual's budget constraint. The distribution of heterogeneous endowments across districts is given by $e^i \in [\underline{e}^i, \bar{e}^i]: h^i(e^i) > 0 \forall i$ with $\sum_{\forall i, -i} \int_{\forall e^i} h^i(e^i) de^i = 1$. Condition (b), $g^i = N t^i \forall i$, is the constraint that public goods are fully financed by taxes.⁹

The nationwide welfare for this economy is given by:

$$NSW = \sum_{\forall i, -i} \int_{\forall e^i} h^i(e^i) v^i(e^i, G^i) de^i \quad (1)$$

⁹ The government's budget constraints say that g^i is financed by a head tax applied only to residents of the district. This configuration allows us to eliminate any possible gains of economies of scale in the provision of local public goods by the central government over sub-national governments. We impose this condition to evaluate whether the Decentralization Theorem of Oates (1972) holds in modern democracies once we introduce political institutions and incentives instead of governments controlled by benevolent social planners.

Let $\hat{\mathbf{g}}^* \in \mathbb{R}^2$: $\hat{\mathbf{g}}^* = [\hat{g}^{*i}, \hat{g}^{*-i}]$ such that $\hat{\mathbf{g}}^* \in \operatorname{argmax} NSW$. We assume $\mathbf{H}(NSW)$ is a negative definite Hessian of NSW . For $\partial NSW / \partial g^i = 0 \ \forall \hat{g}^{*i} > 0, \forall i$, then $\hat{\mathbf{g}}^*$ is a global maximizer of NSW in the constrained policy set.

Proposition 1 characterizes a set of local public goods with and without spillovers that are Pareto efficient and exhaust the gains attributed to matching the size of local public spending to the heterogeneous most preferred individual levels across districts.

Proposition 1. *The Pareto efficient local public goods $\hat{\mathbf{g}}^* = [\hat{g}^{*i}, \hat{g}^{*-i}]$ that match the heterogeneous preferences of individuals across districts satisfy:*

$$\int_{\forall e^i} h^i(e^i) \frac{\partial \mu^i}{\partial G^i} de^i + k^i \int_{\forall e^{-i}} h^{-i}(e^{-i}) \frac{\partial \mu^{-i}}{\partial G^{-i}} de^{-i} = \left\{ \frac{1}{N} \right\} \int_{\forall e^i} h^i(e^i) \frac{\partial \mu^i}{\partial x^i} de^i \quad (2)$$

Proof.

Find $\partial \delta_{NSW} / \partial g^i = 0 \ \forall \hat{g}^{*i} > 0, \forall i$ and re-arrange terms to obtain the result in (2).

In (2) local public goods with and without spillovers are provided at the point in which the marginal social gains in both districts from a marginal change in $\hat{g}^{*i} > 0 \ \forall i$ (equivalent to the change in utility of residents of district i , $\int_{\forall e^i} h^i(e^i) \frac{\partial \mu^i}{\partial G^i} de^i$, and due to inter-regional spillovers the change in utility of residents of district $-i$, $k^i \int_{\forall e^{-i}} h^{-i}(e^{-i}) \frac{\partial \mu^{-i}}{\partial G^{-i}} de^{-i}$) is equal to the social marginal costs, $\left\{ \frac{1}{N} \right\} \int_{\forall e^i} h^i(e^i) \frac{\partial \mu^i}{\partial x^i} de^i$, of financing local spending through taxation. At $\hat{g}^{*i} > 0 \ \forall i$ the aggregate surplus from local public goods is maximized. The heterogeneity of endowments of individuals across districts implies that $\hat{g}^{*i} \neq \hat{g}^{*-i}$.

4.2 Party Centralization in a Democratically Centralized Government

Now we expand the framework to incorporate electoral competition in the presence of party centralization. Although there is a large and growing literature of political economy and fiscal federalism (for a

survey see Lockwood 2008), the theoretical analysis of the effect of party (de)centralization in the provision of local public goods has not been studied adequately. To the best of our knowledge, we are the first to study this issue formally. In the section that follows we introduce a model of electoral competition and party centralization with democratic centralization. Then we provide a model of electoral competition and party centralization in which local public goods are supplied by a system of local governments. Then we develop a comparative analysis of these equilibriums.

In our economy, the parties' problem is to aggregate the heterogeneous and conflicting preferences of voters for public spending into a policy platform that maximizes the parties' probabilities of winning the election. In the first stage, candidates announce policies and party leaders nominate the candidate that will run in the general election with the party label. We do not model the decision of citizens to become candidates; we simply assume two candidates in each party look for the nomination of their parties. For an economy with party centralization, party leaders have full command over policy making by nominating only those candidates who adopt the "ideal" fiscal policy of party leaders. In the second stage of the political process, voters observe the parties' announced policies and elect a public official in the general election. All individuals vote.

Two parties, labeled z and $-z$, compete in the election to form the government in a majoritarian electoral system with single member districts. The winning candidate takes all, forms the government, and implements policy. Under a central government, local public goods are provided by a single government that represents voters of all districts. The government finances its expenditures through a uniform tax on residents of all districts. As discussed above, we follow the literature by assuming that local public goods provided by the central government are uniform across districts (see Oates 1972, 1995).

During the second stage of the electoral process, individuals vote for the party that advances the spending policy that is closest to their own preferences on public spending. Denote $\Psi_c^{zi} = v^{zi}(e^i, G^{zi}) - v^{-zi}(e^i, G^{-zi})$ where Ψ_c^{zi} is the difference in the voter's payoff if party z is elected and implements policies g^{zi} and $g^{z,-i}$ in districts i and $-i$ instead of the alternative policies g^{-zi} and $g^{-z,-i}$ when party $-z$ is elected. The

voter type e^i votes for party z if $\Psi_c^{zi} > 0$; if $\Psi_c^{zi} < 0$ he votes for party $-z$, and the voter flips a fair coin if $\Psi_c^{zi} = 0$.

From the point of view of parties, the individual's vote is uncertain (voting is probabilistic). The probability that a voter type e^i votes for party z in district i is $F_c^{zi}(\Psi_c^{zi}) = \int_{-\infty}^{\Psi_c^{zi}} f_c^{zi}(\Psi_c^{zi}) d\Psi_c^{zi}$, where $f_c^{zi}(\Psi_c^{zi})$ is a continuous probability distribution over Ψ_c^{zi} . The expected vote of party z in district i is $\phi_c^{zi} = \int_{\forall e^i} h^i(e^i) F_c^{zi}(\Psi_c^{zi}) de^i$ and the expected vote in both districts is $\phi_c^z = \sum_{\forall i, -i} \phi_c^{zi}$. Define $\pi_c^z : \rho_c^z = \phi_c^z - \phi_c^{-z} \rightarrow [0,1]$ as a continuous cumulative distribution over the plurality of the party, ρ_c^z , where $\pi_c^z = \int_{-\infty}^{\rho_c^z} w_c^z(\rho_c^z) d\rho_c^z$ and $w_c^z(\rho_c^z)$ is the probability distribution over the party's plurality.

The equilibrium provision of local public goods for a democracy with a majoritarian electoral system, party centralization, and a nationwide election to form the central government, g_c^{*z} , is characterized in proposition 2. Under our assumptions, Downsian parties converge in their fiscal platforms since they maximize a continuous and strictly concave probability of winning the election in the constrained policy set based on a common system of beliefs and strategy policy set.¹⁰ Formally,

Proposition 2 *Parties z select $g_c^{*z} \forall z, -z$ for an economy with party centralization and a democratically centralized government such that*

$$\begin{aligned} g_c^{*z} &\in \operatorname{argmax} \pi_c^z(\rho_c^z) \\ \text{subject to } g_c^{zi} &= g_c^{z,-i} = g_c^z \quad \forall z \end{aligned} \quad (3)$$

Define $\mathbf{g}_c^z = [g_c^{zi}, g_c^{z,-i}]$, ξ_c^z and $\delta_c^z(\mathbf{g}_c^z, \xi_c^z) = \pi_c^z + \xi_c^z\{g_c^{zi} - g_c^{z,-i}\}$. Moreover, we assume $\mathbf{H}(\delta_c^z)$ is a negative definite Hessian of δ_c^z . For the case \mathbf{g}_c^{*z} , ξ_c^{*z} satisfies $\partial\delta_c/\partial g_c^{zi} = 0 \quad \forall g_c^{*zi} > 0$ and $\partial\delta_c/\partial \xi_c^z = 0 \quad \forall \xi_c^{*z} \neq 0$ then \mathbf{g}_c^{*z} is a global maximizer of π_c^z in the constrained policy set.

¹⁰ For a formal proof of convergence in probabilistic voting models with homogeneous parties see Coughlin (1992).

Lemma 1 *Local public goods are Pareto efficient for an economy with a majoritarian electoral system, single member districts, a democratically centralized government, a centralized party system, and for $k^{-i} \in [0, 1) \forall -i, i$. All parties converge in providing a uniform local public good across districts, $g_c^{*zi} = g_c^{*z,-i} = g_c^* \forall z$ satisfying*

$$\sum_{\forall i, -i} (1 + k^{-i}) \int_{\forall e^i} h^i(e^i) \frac{\partial \mu^i}{\partial G^i} de^i = \left\{ \frac{1}{N} \right\} \sum_{\forall i, -i} \int_{\forall e^i} h^i(e^i) \frac{\partial \mu^i}{\partial x^i} de^i = 0 \quad (4)$$

Proof

See the appendix.

Lemma 1 says g_c^* is Pareto efficient for all $k^{-i} \in [0, 1) \forall -i, i$ since a nationwide election provides voting rights to residents of all districts and parties have electoral incentives to aggregate the individuals' benefits (the left hand side of 4) and the costs (the right hand side of 4) from the provision of the uniform local public good in all districts.

4.3 *Party Centralization and Local Governments*

We now consider the case where there is still party centralization but local public goods are provided by a system of local governments. Two parties compete in the local election of each district to form the local government. In a federation with a centralized party system, the leaders of nationwide parties face multiple electoral contests and nominate candidates who propose policies that maximize the party's *joint* probability of winning the elections in districts i and $-i$. As mentioned above, in a centralized party system, party leaders have full command on policy making by nominating only those candidates who adopt the ideal fiscal policy of party leaders. The winning party in each district takes all, forms the government, and designs policy. Local public goods in each district are chosen by the government of the district and expenditure is financed by a uniform tax on residents of the district.

Anticipating the results below, this section has two main findings. First, we show that party centralization in a system of local governments leads to Pareto efficient local public goods with and without inter-regional spillovers. Moreover, in a system of local governments public spending is differentiated to match the heterogeneous tax and spending policies demanded by voters across districts. Second, we show that the provision of local public goods by a system of local governments is welfare superior to the uniform provision of local public goods with and without spillovers if parties are centralized, party leaders seek to maximize votes, the spending policies demanded by voters across districts are heterogeneous, and the centralized provision does not lead to economies of scale.

We define the joint probability of party z winning the elections in districts i and $-i$ by $\pi_{CL}^z = \pi_{CL}^z(\rho_{CL}^{zi}, \rho_{CL}^{z,-i})$ as a function of the pluralities of the party in both districts, ρ_{CL}^{zi} and $\rho_{CL}^{z,-i}$, where $\rho_{CL}^{zi} = \phi_{CL}^{zi} - \phi_{CL}^{-zi} \forall z, \forall i$, and $\phi_{CL}^{zi} = \int_{\forall e^i} h^i(e^i) F_{CL}^{zi}(\Psi_{CL}^{zi}) de^i$ is the proportion of votes that party z expects to receive in the local election of district i , and $F_{CL}^{zi}(\Psi_{CL}^{zi})$ is the marginal probability that a voter type e^i votes for the party in the district's election.

Proposition 3 *In the local election of district i of an economy with party centralization, parties z and $-z$ select*

*$g_{CL}^{*zi} \forall i$ such that*

$$g_{CL}^{*zi} \in \operatorname{argmax} \pi_{CL}^z(\rho_{CL}^{zi}, \rho_{CL}^{z,-i}) \quad (5)$$

Define $\mathbf{g}_{CL}^z = [g_{CL}^{zi}, g_{CL}^{z,-i}]$, and assume $\mathbf{H}(\pi_{CL}^z)$ is a negative definite Hessian of π_{CL}^z . For \mathbf{g}_{CL}^{*z} satisfying $\partial \pi_{CL}^z / \partial g_{CL}^{*zi} = 0 \forall g_{CL}^{*zi} > 0, \forall i$ \mathbf{g}_{CL}^{*z} is a global maximizer of π_{CL}^z in the constrained policy set.

On what follows, Lemma 2 characterizes the equilibrium spending policies for this economy and Theorem 1 shows the main result of this section.

Lemma 2 *Party centralization in a system of local governments leads to a set of Pareto efficient local public goods $\mathbf{g}_{\text{CL}}^* = [g_{\text{CL}}^{*i}, g_{\text{CL}}^{*-i}]$ for local public goods with and without spillovers. At the political equilibrium, $g_{\text{CL}}^{*i} \forall i, \forall z$ satisfies the following:*

$$\int_{\forall e^i} h^i(e^i) \frac{\partial \mu^i}{\partial G^i} de^i + k^{-i} \int_{\forall e^{-i}} h^{-i}(e^{-i}) \frac{\partial \mu^{-i}}{\partial G^{-i}} de^{-i} = \left\{ \frac{1}{N} \right\} \int_{\forall e^i} h^i(e^i) \frac{\partial \mu^i}{\partial x^i} de^i \quad (6)$$

Proof

See the appendix.

Lemma 2 says that in each district i parties choose a policy that is equivalent to a policy that maximizes an anonymous Utilitarian nationwide social welfare function subject to the constraint that the local public good of the district is financed by the residents of the district.¹¹ As a result, the spending policies in a system of local governments are Pareto efficient for local public goods with and without spillovers. Even though a local election in district i does not provide voting rights to voters of other jurisdictions, local public goods are Pareto efficient because the political process is centralized and rational parties recognize that the inter-regional externalities of local public goods create an interdependence between the parties' share of vote in the local elections of districts i and $-i$. Thus, parties have electoral incentives to propose spending policies that internalize the inter-regional spillovers to maximize the party's joint probability of winning local elections in districts i and $-i$.

Theorem 1 “Strong Decentralization Theorem”: *The provision of local public goods with and without inter-regional spillovers by a system of local governments welfare-dominates their centralized provision when party systems are centralized.*

Proof

¹¹ See the equivalence between the results in expressions 2 and 6 implying $g_{\text{CL}}^{*i} = \hat{g}^{*i} \forall i$.

See the appendix.

Theorem 1 says that with and without inter-regional spillovers, the nationwide welfare of voters is higher when local public goods are provided by a system of local governments than when these local public goods are provided by the central government. This is a stronger version of the decentralization theorem in Oates (1972), where the decentralized provision by a system of local governments is welfare superior to the centralized provision only when local public goods do not display inter-regional spillovers.

Note, first, that the provision of local public goods with and without inter-regional spillovers is Pareto efficient under both a central government and a system of local governments. Second, party centralization and local elections induce parties to select the size of public spending that maximizes a unanimous utilitarian nationwide social welfare without imposing the constraint that local public goods must be uniformly provided, as it is the case of the centralized provision. By matching the individuals' demand for heterogeneous policies for public spending across jurisdictions, the Pareto efficient provision of local public goods with and without regional spillovers in a federation exhausts the nationwide welfare benefits to be gained from the matching of local public goods to local preferences. Since the central government does not differentiate local public goods to match local preferences, a system of local governments is welfare superior to the uniform provision.

An important assumption in our analysis is that the central government is constrained to provide uniform local public goods. This assumption is justified because our analysis seeks to identify political institutions that create incentive environments in which the decentralization theorem may hold or fail. Hence, it seems natural to consider the conditions originally identified by Oates (1972) as our benchmark model. Moreover, our assumption that the central government provides uniform public goods is quite standard in the literature, and it has been the foundation of much of the literature on fiscal federalism. In particular, it is now agreed that central governments may provide heterogeneous services but that the central government may also have less information and therefore that the process may be more costly (Cremer and Palfrey 1996). Moreover, although federations may lead to horizontal fiscal externalities (Wilson 1999) and citizens could benefit from a

coordinated central policy, this could also lead to less accountability and efficiency (Seabright 1996). Related to this same issue, Tomassi and Weinschelbaum (2003) characterize a tradeoff between externalities and accountability in which decentralization might be preferred even if preferences are identical. In summary, assuming that the central government provides uniform public goods could be interpreted as just convenient shorthand for assuming that decentralized governments can be more efficient in matching local preferences and needs than the central government.

However, it is relevant to consider how sensitive our results are to removing the uniformity assumption. First, we argue that it is likely that a system of local governments is still welfare superior to the centralized provision because the decentralized provision is Pareto efficient with and without spillovers and the central government has political incentives to equalize the marginal political benefits and costs of allocating \$1 across jurisdictions while the system of local governments does not operate under these constraints. As a result, the degree of differentiation by the central government might not exhaust the gains from matching the preferences of voters across districts. On the other hand, the decentralized provision of local public goods maximizes these gains.

Second, Kochi and Ponce (2011) characterize conditions in which the centralized provision of local public goods would be uniform even though differentiation is feasible. They show that the heterogeneity of the voters' preferences across districts does not have a monotone effect on the centralized provision of local public goods. If the heterogeneity of preferences is moderate (or spillovers are moderate) then the central government has political incentives to provide differentiated local public goods. However, if the heterogeneity of preferences is high or spillovers are large then the central government has electoral incentives to satisfy the demand for local public spending from the high demand district. Because of spillovers, or significant inter-regional heterogeneity, the supply of the local public good in the high demand district drives the marginal electoral benefit of producing a local public good in the low demand district to zero. As a result, the central government offers a local public good only in the high demand district and the provision of local public goods is uniform across districts. Therefore, there are conditions in which the decentralized provision is still welfare

superior to the centralized one even though a differentiated centralized provision is feasible. Hence our assumption also could be considered as a simplification of the conditions identified by Kochi and Ponce (2011).

4.4 *Party Decentralization and Democratic Decentralization*

We now turn our analysis to the provision of local public goods for a democracy with a majoritarian electoral system, single member districts, and decentralized party systems. For the case of party decentralization, a primary election takes place in which residents first vote to nominate a candidate while later in the general election voters elect a public official. In this setting, our interest is to analyze how the political institution of primaries creates incentives for parties to represent the interests of a broad set of voters in the electorate versus the preferences of a minority coalition of voters in the provision of local public goods. In the latter case, the government seeks to target the benefits of the collective action to a particular group.

Proponents of decentralized parties argue that primary elections promote the political participation of voters and the representation of their interests in the policies eventually implemented by the government. However, the participation rules of primaries might actually limit both the voters' participation in elections and their effective political influence on policy design.

Primary elections can be open, semi-closed, and closed (see Kaufman and Gimpel 2003). In open primaries voters of any affiliation may vote for any party while in closed primaries only those voters affiliated with a party (probably partisan voters) can vote in the party's primary. In closed primaries candidates have electoral incentives to weigh (discount) heavily the preferences over policy of those voters who can (not) participate in the primary election. Hence, parties might have electoral incentives to implement the ideal provision of local public goods of primary voters. This might be considered socially undesirable because in this case public spending does not maximize the net fiscal exchange associated with the provision of local public

goods for all residents but it maximizes the net fiscal surplus from public goods for a minority coalition of voters in the electorate (the primary voters).¹²

The main results of this section are: first, the strong decentralization theorem does not hold for economies with decentralized party systems. We also find that the specific institutions of primaries might (not) lead to the expected benefits of democratic decentralization. In particular, the conventional decentralization theorem (which assumes no spillovers) holds for economies with majoritarian electoral systems, single member districts, and decentralized party regimes with *open* primaries. However, if the primaries are *closed*, the decentralization theorem, in general, does not hold. In summary, our theory shows that the political institutions of party decentralized systems may also matter considerably in how efficient democratic decentralization outcomes actually are.

4.5 *Primary and General Elections with Democratically Centralized and Decentralized Governments*

Consider first the case in which parties compete for a single national government in a sequential electoral contest. In the first stage of our model, two individuals, denoted by j and j' in each party seek the nomination of their party by declaring their binding policy platforms over public spending. All voters observe the candidates' policies but only qualified voters vote in the primary election.¹³ In a closed primary the right to vote is limited only to voters affiliated with the party, and in open primaries all voters (those affiliated and not affiliated with some party) can vote to nominate a candidate.¹⁴ The candidate who receives the majority of the votes across all districts wins the nomination of her party.

¹² The net fiscal surplus of local public goods reflects the following tradeoff: on the one hand, an increase of public spending leads to higher utility of voters (this is the marginal benefit). On the other hand, higher spending requires higher taxes and lower consumption of private goods (this is the marginal cost). At low taxes, public spending is also low which implies that the marginal benefit is likely to outweigh the marginal costs of increasing the provision of local public goods. This guarantees that at the equilibrium, the fiscal exchange associated with the provision of local public goods entails a non-negative surplus. See, for example, Martinez-Vazquez (1982).

¹³ The assumption that, in the first stage of the electoral contest, candidates announce a binding policy platform is for simplicity of the analysis and it ignores dynamic inconsistency issues such as the possibility that candidates might announce different policies in the primary and general election to please, respectively, primary and general election voters.

¹⁴ This assumption implies that if the primary is open then all voters in the economy vote in the primaries of parties z and $-z$, while if the primary is closed then only qualified voters vote in the primary of party z or party $-z$.

In the second stage, the general election takes place and all voters in the electorate vote from the set of nominated candidates to elect a public official. Voting is sincere at the different stages of the electoral contest.¹⁵ The winner of the general election takes all, forms the government, and implements her policy platform. In the first stage of the game, candidates $j, j' \in z$ announce their fiscal platforms on public spending to maximize the joint probability, Π_d^{jz} , of winning the nationwide primary and general elections. Candidates propose a policy platform that is sequentially rational and therefore their policy platform must consider two different states that might be played in the second stage: the candidates might compete in the general election against candidate 1 or 2 of party $-z$.

Define $\Pi_d^{jz} = \int_{-\infty}^{\tilde{\rho}_0^{jz}} \int_{-\infty}^{\rho_1^{jz}} \int_{-\infty}^{\rho_2^{jz}} w_d^{jz}(\tilde{\rho}_0^{jz}, \rho_1^{jz}, \rho_2^{jz}) d\tilde{\rho}_0^{jz} d\rho_1^{jz} d\rho_2^{jz}$, as the joint cumulative mass that $j \in z$ wins both elections where $w_d^{jz} = \partial \Pi_d^{jz} / \partial \tilde{\rho}_0^{jz} \partial \rho_1^{jz} \partial \rho_2^{jz} > 0$, and $\tilde{\rho}_0^{jz}$ is the nationwide plurality of candidate $j \in z$ versus that of candidate $j' \neq j: j' \in z$ in the primary election, and ρ_1^{jz} is the nationwide plurality for the state in which candidate $j \in z$ runs against candidate $1 \in -z$ in the general election. A similar interpretation is given to ρ_2^{jz} .¹⁶

For each of the pluralities in the primary $\tilde{\rho}_0^{jz} = \tilde{\phi}_0^{jz} - \tilde{\phi}_0^{j'z}$ and in the general election and $\rho_l^{jz} = \phi_l^{jz} - \phi_l^{j'-z} \forall l = \{1,2\}$ it is satisfied that $\tilde{\phi}_0^{jz} + \tilde{\phi}_0^{j'z} = 1$ and $\phi_l^{jz} + \phi_l^{j'-z} = 1 \forall l$, where $\tilde{\phi}_0^{jz} = \sum_{\forall i} \tilde{\phi}_0^{jzi}$ is the nationwide expected proportion of the vote in the primary and $\phi_l^{jz} = \sum_{\forall i} \phi_l^{jzi}$ is the nationwide expected proportion of the vote of candidate $j \in z$ for $l = \{1,2\}$ in the general election. The expected proportion of the vote of candidate j in the primary of district i is $\tilde{\phi}_0^{jzi} = \int_{\forall \tilde{e}^i} \tilde{h}^i(\tilde{e}^i) \tilde{F}_0^{jzi}(\tilde{\Psi}_0^{jzi}) d\tilde{e}^i$ where $\tilde{F}_0^{jzi}(\tilde{\Psi}_0^{jzi}) = \partial^2 F^{jzi}(\tilde{\Psi}_0^{jzi}, \Psi_1^{jzi}, \Psi_2^{jzi}) / \partial \Psi_1^{jzi} \partial \Psi_2^{jzi}$ is the continuous marginal probability that a voter type e^i in district i votes for $j \in z$ in the primary, and $F^{jzi} = F^{jzi}(\tilde{\Psi}_0^{jzi}, \Psi_1^{jzi}, \Psi_2^{jzi})$ is the joint probability that the voter type e^i

¹⁵ The assumption that voters vote sincerely also seeks to simplify the analysis and it ignores strategic voting behavior such as credible threats of some coalition of voters who might abstain from voting for the nominated candidate in the general election if the candidate changes the policy position he previously announced in the primary election.

¹⁶ In what follows, and for the convenience of our analysis, we will distinguish voters who participate in the primary election (from voters who participate in the general election) with a tilde.

votes for $j \in z$ in the primary and the general election. Similarly, the corresponding proportion of the vote for $j \in z$ in district i in the general election is $\phi_l^{jzi} = \int_{\forall e^i} h^i(e^i) F_l^{jzi}(\Psi_l^{jzi}) de^i$ for $l = \{1, 2\}$ where F_l^{jzi} is the marginal cumulative mass of $j \in z$ in district i if he faces candidates $l \in \{1 \vee 2\} \in -zi$ in the general election.

The joint probability that voter type e^i votes for $j \in z$ in the primary and the general election $F^{jzi}(\tilde{\Psi}_0^{jzi}, \Psi_1^{jzi}, \Psi_2^{jzi})$ is continuous and non-decreasing with $\tilde{\Psi}_0^{jzi}, \Psi_1^{jzi}$, and Ψ_2^{jzi} . Sincere voting implies that a voter type e^i in district i votes for $j \in zi$ in the nationwide primary and general election if $\tilde{\Psi}_0^{jzi} = \tilde{v}^{jzi}(\tilde{e}^i, G^{jzi}) - \tilde{v}^{j'zi}(\tilde{e}^i, G^{j'zi}) > 0$, $\Psi_1^{jzi} = v^{jzi}(e^i, G^{jzi}) - v^{1,-zi}(e^i, G^{1,-zi}) > 0$, $\Psi_2^{jzi} = v^{jzi}(e^i, G^{jzi}) - v^{2,-zi}(e^i, G^{2,-zi}) > 0$.

Proposition 4 *A candidate j of party z selects g_d^{*jz} for an economy with a democratically centralized government and party decentralization such that*

$$g_d^{*jz} \in \operatorname{argmax} \Pi_d^{jz}(\tilde{\rho}_0^{jz}, \rho_1^{jz}, \rho_2^{jz})$$

$$\text{subject to } g_d^{jzi} = g_d^{jz,-i} = g_d^{jz} \quad \forall j, \forall z \quad (7)$$

Define $\mathbf{g}_d^{jz} = [g_d^{jzi} g_d^{jz,-i}]$, ξ_d^{jz} and $\delta_d^{jz}(\mathbf{g}_d^{jz}, \xi_d^{jz}) = \Pi_d^{jz}(\tilde{\rho}_0^{jz}, \rho_1^{jz}, \rho_2^{jz}) + \xi_d^{jz} \{g_d^{jzi} - g_d^{jz,-i}\}$.

Moreover, assume $\mathbf{H}(\delta_d^{jz})$ is a negative definite Hessian of δ_d^{jz} . For $\mathbf{g}_d^{*jz}, \xi_d^{*jz}$ satisfying $\partial \delta_d^{jz} / \partial g_d^{jzi} = 0 \quad \forall g_d^{*jzi} > 0$ and $\partial \delta_d^{jz} / \partial \xi_d^{*jz} = 0 \quad \forall \xi_d^{*jz} \neq 0$, then \mathbf{g}_d^{*jz} is a global maximizer of $\Pi_d^{jz}(\tilde{\rho}_0^{jz}, \rho_1^{jz}, \rho_2^{jz})$ in the constrained policy set.

Lemma 3 *For economies with a decentralized party system and a democratically centralized government representing voters of all districts, a uniform and Pareto efficient local public good $g^i = g^{-i} = g_d^{*z} \quad \forall z$ is provided such that it satisfies the following:*

$$\sum_{\forall i, -i} \alpha^{zi} \int_{\forall e^i} h^i(e^i) v_g^{zi}(g_d^{*z}) de^i$$

$$= -\gamma^z \left(\sum_{\forall i, -i} \int_{\forall \tilde{e}^i} \tilde{h}^i(\tilde{e}^i) \frac{\partial \tilde{F}_0^{zi}}{\partial \tilde{\Psi}_0^{zi}} \tilde{v}_g^{zi}(g_d^{*z}) d\tilde{e}^i \right) - \sigma_\omega^z \quad (8)$$

Where $v_g^{zi} = \{\partial \mu^{zi} / \partial G^i\} - \left\{ \frac{1}{N} \right\} \{\partial \mu^{zi} / \partial x^i\} \forall zi$. Moreover, $\alpha^{zi} \in (0,1)$:

$$\alpha^{zi} = \sum_{l=\{1,2\}} \frac{\partial \Pi_d^z}{\partial \rho_l^z} \int_{\forall e^i} h^i(e^i) \frac{\partial F_l^{zi}}{\partial \Psi_l^{zi}} de^i \Big/ \sum_{\forall i, -i} \sum_{l=\{1,2\}} \frac{\partial \Pi_d^z}{\partial \rho_l^z} \int_{\forall e^i} h^i(e^i) \frac{\partial F_l^{zi}}{\partial \Psi_l^{zi}} de^i \quad (9)$$

$$\gamma^z = \frac{\partial \Pi_d^z}{\partial \tilde{\rho}_0^z} \Big/ \sum_{\forall i, -i} \sum_{l=\{1,2\}} \frac{\partial \Pi_d^z}{\partial \rho_l^z} \int_{\forall e^i} h^i(e^i) \frac{\partial F_l^{zi}}{\partial \Psi_l^{zi}} de^i \quad (10)$$

γ^z is a weighted rate of substitution between marginal changes in the parties' plurality in the primary and the general election, and

$$\sigma_\omega^z = \sum_{\forall i, -i} \sum_{l=\{1,2\}} \frac{\partial \Pi_d^z}{\partial \rho_l^z} \sigma_l^{zi} \left(\frac{\partial F_l^{zi}}{\partial \Psi_l^{zi}}, \frac{\partial \Psi_l^{zi}}{\partial g_d^z} \right) \Big/ \sum_{\forall i, -i} \sum_{l=\{1,2\}} \frac{\partial \Pi_d^z}{\partial \rho_l^z} \int_{\forall e^i} h^i(e^i) \frac{\partial F_l^{zi}}{\partial \Psi_l^{zi}} de^i \quad (11)$$

Where σ_ω^z is a weighted covariance between the marginal probability of voting for party z in the nationwide general election, $\partial F_l^{zi} / \partial \Psi_l^{zi}$, and the change in the wellbeing of voters from an increase in the provision of the local public good $\partial \Psi_l^{zi} / \partial g_d^z$.

Proof

See the appendix.

Lemma 3 says that sequential elections (with a primary and a general election) induce candidates to propose a uniform policy that reflects a compromise between the ideal policy of a nationwide weighted average voter of the primary and the ideal policy of a nationwide weighted average voter of the general election (see expression 8). In this Lemma, the left hand side of (8) is a weighted average of marginal indirect utility gains (or the net fiscal exchange) due to a marginal change in the public good for voters of all districts participating in the general election. The parameter $\alpha^{zi} \in (0,1)$ reflects the relative political influence over candidates of

residents of district i (the higher α^{zi} the closer is public spending to the ideal policy of the average voter of district i , and the lower α^{zi} the closer is public spending to the ideal policy of the average voter of district $-i$).

Similarly, the first term of the right hand side of (8) is the corresponding weighted marginal indirect utility gain of primary voters. The expression γ^z is a weighted rate of substitution between marginal changes in the parties' plurality in the primary and the general election. This term reflects the parties' incentives to weigh more (less) heavily the preferences over public spending of primary versus general election voters. The higher γ^z , the higher is the marginal plurality gain of the party in the primary associated with a small increase in g_d^{*z} and the higher the electoral incentives for party z to produce a policy closer to the ideal policy of the weighted average primary voter. If $\gamma^z = 0$, then parties propose the ideal policy of a weighted average voter of the general election.

Moreover, σ_w^z is a weighted covariance between the marginal probability of voting for party z for the individual type e^i , $\partial F_l^{zi} / \partial \Psi_l^{zi}$, and the change in the well-being of the voter from an increase in the provision of the local public good $\partial \Psi_l^{zi} / \partial g_d^z$. Candidates will have electoral incentives to increase the size of the uniform local public good when the electorate is constituted by voters who simultaneously have higher than average marginal probabilities of voting for the candidate and higher than average values of the net fiscal incidence of local public goods (this term is $\partial \Psi_l^{zi} / \partial g_d^z$).

Let us now proceed to characterize the provision of local public goods in a system of local governments with party decentralization. A detailed description of the electoral game for an economy with party decentralization in a system of local governments is omitted for space reasons. However, the structure of the game is easily extended from our previous discussion: local primary and general elections take place. Candidates j, j' in each party, and in each district, announce policy platforms that maximize the joint probability of the candidate, say $j \in z$, of winning the primary and general elections in their district, $\pi_{dL}^{zi}(\tilde{\rho}_0^{zi}, \rho_1^{zi}, \rho_2^{zi})$. Only qualified residents of the district vote in the local primary while all the residents of the district can vote in the local general election. Voting is sincere in both elections. The local general election takes place, the winner takes all, and implements his policy platform.

Proposition 5 *In the local election of district i of an economy with party decentralization, all candidates j, j' of party z select $g_{dL}^{*zi} \forall z$ such that*

$$g_{dL}^{*zi} \in \operatorname{argmax} \pi_{dL}^{zi}(\tilde{\rho}_0^{zi}, \rho_1^{zi}, \rho_2^{zi}) \quad (12)$$

We assume $\mathbf{H}(\pi_{dL}^{zi})$ is a negative definite Hessian of π_{dL}^{zi} . If $g_{dL}^{*zi} \forall z$ satisfies $\pi_{dL}^{zi}/\partial g_{dL}^{*zi} = 0 \forall g_{dL}^{*zi} > 0, \forall z$ then g_{dL}^{*zi} is a global maximizer of π_{dL}^{zi} in the constrained policy set.

On what follows, Lemma 4 provides a general characterization of local public goods for an economy with majoritarian rule, single member districts, party decentralized regimes and a system of local governments. Also, Theorems 2 and 3 show that the strong decentralization theorem (which is robust to inter-jurisdictional spillovers) is not satisfied for economies with decentralized party systems and that the conventional decentralization theorem holds in the case of open primaries and fails to hold in the case of closed primaries.

Lemma 4 *For economies with party decentralization and a system of local governments representing voters in each district, local public goods $g_{dL}^{*zi} \forall i, -i$ are provided such that g_{dL}^{*zi} satisfies the following:*

$$\int_{\forall e^i} h^i(e^i) v_{g_{dL}^{*zi}}^{zi}(g_{dL}^{*zi}) de^i = -\chi^{zi} \left(\int_{\forall \tilde{e}^i} \tilde{h}^i(\tilde{e}^i) \frac{\partial \tilde{F}_0^{zi}}{\partial \tilde{\Psi}_0^{zi}} \tilde{v}_{g_{dL}^{*zi}}^{zi}(g_{dL}^{*zi}) d\tilde{e}^i \right) - \sigma_\omega^{zi} \quad (13)$$

Where

$$\chi^{zi} = \frac{\partial \pi_{dL}^{zi}}{\partial \tilde{\rho}_0^{zi}} \bigg/ \sum_{l=\{1,2\}} \frac{\partial \pi_{dL}^{zi}}{\partial \rho_l^{zi}} \int_{\forall e^i} h^i(e^i) \frac{\partial F_l^{zi}}{\partial \Psi_l^{zi}} de^i \quad (14)$$

Where χ^{zi} is a weighted rate of substitution between marginal changes in the party's plurality in the district's primary and the general local election, and

$$\sigma_\omega^{zi} = \sum_{l=\{1,2\}} \frac{\partial \pi_{dL}^{zi}}{\partial \rho_l^{zi}} \sigma_l^{zi} \left(\frac{\partial F_l^{zi}}{\partial \Psi_l^{zi}}, \frac{\partial \Psi_l^{zi}}{\partial g_{dL}^{*zi}} \right) \bigg/ \sum_{l=\{1,2\}} \frac{\partial \pi_{dL}^{zi}}{\partial \rho_l^{zi}} \int_{\forall e^i} h^i(e^i) \frac{\partial F_l^{zi}}{\partial \Psi_l^{zi}} de^i \quad (15)$$

Where σ_{ω}^{zi} is a weighted covariance between the marginal probability that voter type e^i votes for party z in the local general election in district i , $\partial F_l^{zi}/\partial \Psi_l^{zi}$, and the change in the well being of voters from an increase in the provision of the local public good $\partial \Psi_l^{zi}/\partial g_{dL}^{zi}$.

Proof

See the appendix.

The interpretation of this equilibrium is similar to that given in Lemma 3. In local elections, parties provide a public good that reflects a compromise between the ideal spending policies of the district's weighted average voter in the primary election and the district's weighted average voter in the general election (this is condition 13). The parties' incentives to weigh more (less) heavily the preferences over public spending of primary versus general election voters in district i are given by χ^{zi} . The higher χ^{zi} , the higher the electoral incentives for party z to produce a policy closer to the ideal policy of the weighted average voter of the primary in district i . If $\chi^{zi} = 0 \forall i$, then parties propose the ideal policy of the weighted average voter of the general election in each district.

In open primaries, local public goods are Pareto efficient for all values of χ^{zi} (because in our model the distribution of voters participating in the primary election is exactly the same as the distribution of voters participating in the general election). However, for closed primaries, local public goods are Pareto efficient except for the case in which χ^{zi} is high enough because, in this case, local public goods maximize the well-being of local primary voters (a local minoritarian coalition in the district).

Moreover, the expression, σ_{ω}^{zi} , is a weighted covariance between the marginal probability of voting for party z in the general election of the district, $\partial F_l^{zi}/\partial \Psi_l^{zi}$, and the change in well being of voters from an increase in the provision of the local public good, $\partial \Psi_l^{zi}/\partial g_{dL}^{zi}$. For $\sigma_{\omega}^{zi} > 0$; the higher σ_{ω}^{zi} the higher the provision of the public good in the district.¹⁷

¹⁷ The parameter σ_{ω}^{zi} determines whether government spending is high (low) at the political equilibrium. Example, the combination of $\chi^{zi} = 0 \wedge \sigma_{\omega}^{zi} > 0 \forall i, \forall z$ implies that local governments produce local public goods that maximize a utilitarian social welfare of all

Theorem 2 *In majoritarian democracies with a decentralized party system, open primaries, and single member districts, the strong decentralization theorem does not hold but the conventional decentralization theorem holds.*

Proof

See the appendix

On the one hand, Theorem 2 shows that candidates running for local governments in a party decentralized system with open primaries have incentives to propose the size of public spending that maximizes a unanimous Utilitarian social welfare function of local residents in *each* jurisdiction. In other words, under local elections with open primaries, parties propose the ideal policy of the average voter of the district and therefore the resulting policies are Pareto efficient but only for local public goods without spillovers. Therefore the strong decentralization theorem does not hold for economies with party decentralized systems and *open* primaries. Moreover, the local provision of public goods matches the heterogeneous preferences of voters across districts.

On the other hand, if the government is democratically centralized and there is party decentralization with open primaries the provision of local public goods with and without spillovers is uniform and Pareto efficient. In this case, the size of the local public good reflects the ideal size on public spending from the average voter of all districts.¹⁸ Lastly, Theorem 2 shows that if local public goods do not display regional spillovers then a system of local governments supplying local public goods $g_{dl}^{*i} > 0$ in districts i and $-i$ is welfare superior to a uniform provision, $g_d^* > 0$, by a centralized government, because the heterogeneous

residents in the district (which is explained by $\chi^{zi} = 0 \forall i, \forall z$) and the size of the local public good is high at the equilibrium which is explained by a high value of $\sigma_w^{zi} > 0 \forall i, \forall z$. If $\sigma_w^{zi} < 0 \forall i, \forall z$, the size of the local public good is too low at the equilibrium.

¹⁸ In open primaries the distribution of ideal policies of primary and general election voters is the same. For this reason, candidates in local elections have strong incentives to select the ideal policy of the average voter of the district (which means that local public goods without spillovers are Pareto efficient) while candidates competing in a nationwide election have also strong incentives to choose the ideal policy of the average voter of all districts (which means that local public goods with and without spillovers are efficient).

provision of local public goods by a democratically decentralized system will maximize the welfare gains of policy differentiation. Consequently, the conventional decentralization theorem holds for majoritarian democracies with decentralized party regimes and open primaries.

Theorem 3 *The strong and the conventional decentralization theorems do not hold in majoritarian democracies with single member districts and decentralized party systems with closed primaries.*

Proof

See the appendix

In general, the strong and the conventional decentralization theorems do not hold for a democracy with party decentralization and closed primaries.¹⁹ As we mentioned before, sequential elections (with a primary and a general elections) induce candidates to propose a policy that reflects a compromise between the ideal policy of a weighted average voter of the primary and the ideal policy of a weighted average voter of the general election (see expression 8). In the case of closed primaries, it is likely that minority coalitions (i.e. primary voters) could have strong political influence over local governments that is translated into policies on local public goods that are closer to their preferences. In this case, electoral competition might produce extreme policy positions (too much or too little local public spending) instead of the policy that maximizes the surplus from the net fiscal exchange for the society as a whole.

For instance, in condition (13) there are parametric values of χ^{zi} in which local elections produce the size of public spending in the vicinity of the ideal policy of primary voters in each district (a minority of the society) instead of the ideal policy of all residents in each district (the utilitarian measure of social welfare).²⁰

¹⁹ A comparison of (8) and (2) shows that the electorally optimal policy for Downsian candidates in a nationwide sequential election with closed primaries is, in general, different from the size of public spending that maximizes the fiscal surplus from public spending for all residents in the economy. A similar conclusion is reached for local elections in a federation (see conditions 13 and 2). As a result, the strong decentralization theorem does not hold. In the appendix we also show that, in general, the conventional decentralization theorem does not hold for economies with party decentralization and closed primaries.

²⁰ In particular, significantly large values of $\chi^{zi} \forall i$ imply that the marginal change of the joint probability of winning the primary and the general election due to a marginal gain from the plurality of the primary is sufficiently high (maybe because the candidate who

Simultaneously, we can find parametric values in the equilibrium in which there is a centralized government that averages the political influence of local coalitions to produce a more moderate provision of local public goods that could be welfare superior to the less moderate provision of public goods in the system of local governments (i.e. when $\gamma^z \rightarrow 0 \wedge \chi^{zi} > 0 \forall i, \forall z$ and sufficiently high). This is likely true for an economy with many localities in which the political influence of local coalitions is significant over local governments but the influence of local minority groups fades away in the nationwide election. Therefore, in this setting, the provision of a uniform public good by a centralized government could be welfare superior to the set of differentiated but extreme policy positions produced by a system of local governments.²¹

In summary, we have shown in our model that political institutions may matter considerably in how efficient fiscal decentralization outcomes actually are. We have seen that a strong version of the decentralization theorem—in the presence of externalities—holds for a system of democratically decentralized local governments operating within a centralized party system. In addition the strong decentralization theorem does not hold for economies with party decentralized systems but the conventional decentralization theorem (which requires the absence of interregional externalities) holds for a system of democratically decentralized local governments operating within a decentralized party system with *open* primaries. However, the conventional decentralization theorem does not hold for a system of democratically decentralized local governments operating within a decentralized party system and *closed* primaries. In the next section we explore how those different sets of political institutions actually affect local public goods outcomes in the real world.

5 *Empirical Analysis*

In this section we test the hypothesis that political institutions affect the efficiency with which local public goods are provided. More specifically, we evaluate the key expectation stemming from our formal

wins the primary would win with almost certainty the general election) and therefore party z will select the ideal policy of a minority of the electorate (i.e. the ideal policy of the weighted average voter of the primary in district i).

²¹ It is also simple to characterize conditions in which a system of local governments would produce public goods that are Pareto superior to those provided by a democratically centralized government.

model that the combination of democratic decentralization and party centralization will lead to the best delivery of local public goods, other things equal.²² To do this, we make use of a series of quantitative models of all electorally competitive countries from 1976 to 2006, contingent on data availability. Our most expansive model considers 2237 observations and 135 countries, to our knowledge the broadest examination of sub-national political institutions in the literature.

We employ five different measures of educational outcomes and three different measures of health outcomes to operationalize our dependent variable, the provision of public goods at the sub-national level. Education and health measures are often used in the empirical literature to denote public goods provision at the sub-national level (see, for example, Enikolopov and Zhuravskaya 2007 and Faguet and Sanchez 2008). Our specific measures come from World Bank (2010) and include *Primary School Completion Rate*, *Primary School Teachers* as a proportion of youth population, *Children out of School* as a proportion of youth population, *Primary Enrollment Rate*, *Primary School Ratio of Girls to Boys*, *Children Receiving DPT Immunizations*, *Public Health Expenditures*, and *Infant Mortality*. Note that, for robustness, these variables include indicators of both policy input (i.e. *Public Health Expenditures*) and final policy outcome (i.e. *Infant Mortality*). Indeed, in order to determine whether our theory operates through increased spending or increased policy efficiency, we divide our health policy analyses into one model that considers inputs and two that measure outputs. Consistent with the literature, these latter models make use of a policy outcome as the dependent variable and also control for spending. We are unable to construct our education model in this way because educational spending data are much sparser. We discuss how our eight dependent variables are coded and provide some summary statistics in Table 1.

Insert Table 1 here

²² At the sub-national level, we are unable to differentiate empirically between types of primaries and whether open list systems are more or less decentralized. For that reason, we compare centralized and decentralized parties in the aggregate. As noted above, our theory predicts that the strong decentralization theorem should hold for all systems with centralized parties but only for some with decentralized parties. This finding is consistent across both majoritarian and proportional electoral systems. For that reason, if our arguments are correct, an aggregate comparison of centralized and decentralized parties should reveal some differential effects.

We select educational and health outcomes as our dependent variables because they allow us to examine both allocative efficiency gains (i.e. differentiation based on local preference – the main hypothesized benefit of decentralization as reflected in the decentralization theorem) and the degree to which public goods are provided in the face of spillovers (our hypothesized benefit of centralized parties). Why should this be so? First, our indicators of educational and health provision are subject to strong extra-jurisdictional spillover effects. All inhabitants of a country benefit from the educational attainment of their fellow citizens — in general, greater knowledge accumulation leads to reduced crime and economic improvements that spill outside the limits of any single jurisdiction. Another source of spillover effects occurs with population mobility – local residents may move outside a jurisdiction after receiving their education, and residents of neighboring jurisdictions may sometimes register for schools not provided in their own locales. For these reasons, the provision of education, as measured by our indicators, can be associated with a greater willingness on the part of local leaders to provide public goods in the presence of spillovers. The same is likely to be the case with the provision of basic health services such as vaccination. In many countries, basic health is under the authority of sub-national governments, and it is a common occurrence for citizens to cross jurisdictional boundaries in pursuit of care. In addition, as with education, there are clear national spillover effects associated with a healthier population.

Our educational and health indicators also capture allocative efficiency effects for at least two reasons. First, improved political accountability resulting from democratic decentralization provides decentralized governments greater incentives to act in accordance with the needs and preferences of their constituents. While most constituencies will prize superior educational outcomes, different sorts of practices are likely to produce these outcomes in different locales. For example, in one jurisdiction, limited resources might best be channeled into increasing the number of teachers, whereas in another improved educational materials might be the focus. As a result, we believe that superior educational provision likely reflects (other things equal) an ability on the part of officials to consider local preferences and conditions. In a similar way, while all citizens are likely to favor high quality health services, scarce local resources may, for example, be more efficiently used on medical centers in one constituency and on medicines in another. Positive health outcomes are therefore more likely to

obtain, we believe, when local governments can target their resources to the differing needs of their constituents.

Second, the literature also bears out our use of educational and health outcomes to measure allocative efficiency and the internalization of spillovers. For example, two papers (Faguet and Sanchez 2005 and Solé-Ollé and Esteller-Moré 2005) conclude that decentralization leads to better adjustment between investment patterns and local demands (in Bolivian municipalities in the first instance and Spanish provinces in the second). Similarly, in a more recent paper, Arze del Granado, Martinez-Vazquez, and McNab (2012) analyze the effects of decentralization on the composition of public expenditures for a large panel of countries and conclude that decentralization of public goods delivery is usually accompanied by an increase in educational expenditures. This finding asserts that decentralization, via greater responsiveness of public officials and preference matching, can increase allocative efficiency by altering the composition of public expenditures. And an analysis by Cerniglia and Longaretti (2013) shows that the targeting of educational services to the specific preferences of different jurisdictions can contribute to more rapid human capital accumulation and accelerated growth.

On the right side of the equation, our theory requires that we consider both the existence of elected sub-national governments and the level of party decentralization at the sub-national level. We develop an original dataset of sub-national political institutions to capture both of these measures, which we code for all countries between 1975 and 2007, where data are available. As part of this dataset, we code for the presence of elections, the structure of legislative-executive relations, the electoral system, the extent to which the national party system is replicated, and the centralization of parties at both the highest sub-national level and the municipal level (defined as the lowest level of sub-national government).²³

To operationalize party centralization, we make use of an indicator first developed by Carey and Shugart (1995) and labeled the “Ballot” variable. This variable measures what is perhaps the most significant power

²³ Note that another comprehensive dataset of sub-national indicators has recently been produced by Ivanyna and Shah (2012), but their focus is not on the specific political institutions that we code.

that national party leaders can wield – the power to nominate candidates for office. The ballot variable is coded “0” when national party leaders have full nomination powers, “1” when they nominate a list but voters have the power to change its order (as in open list or alternate vote systems), and “2” when they have little power over nomination (as in primary systems or systems where candidates get on the ballot by collecting signatures or paying a fee). Carey and Shugart coded their variable for a small number of representative cases, and Hankla (2006) later added all democracies from 1975 to 2004. We expand these datasets by capturing not just the power of national party leaders to nominate candidates for the national legislature, but also whether these national party leaders can nominate candidates to regional and local assemblies.

Yet, simply coding party centralization is not enough to measure the power of national party leaders over sub-national and municipal elections. We also need to know whether national parties are competing and winning in these elections. If only 10% of a municipal council’s seats are held by national parties, or if, for example, 50% of its seats are chosen in non-partisan elections, national party influence cannot be significant even if parties are centralized as defined above.

Drawing on these considerations, we create two key independent variables from our dataset to include in the model. Our first dummy variable, labeled *Democratic Decentralization, Party Centralization*, is coded “1” when (1) there are municipal elections, and (2) more than 75% of municipal council seats are held by national parties, and (3) national party leaders exercise centralized power over municipal party nomination (i.e. party centralization is coded “0” above).²⁴ Our second, labeled *Democratic Decentralization, Party Decentralization*, is coded “1” when (1) there are municipal elections, and either (2) 75% or fewer of municipal council seats are held by national parties, or (3) national party leaders do not control party nomination in municipal elections. Our omitted reference category, of course, is systems with no democratic decentralization at all. To our

²⁴ Note that the extent of local party system nationalization can vary by municipality within individual countries, and that party centralization can vary by party within individual countries. There tends, all the same, to be a great deal of commonality in party system nationalization and party structure within a country, allowing for relatively straightforward coding in most cases. That said, when we encountered mixed cases, we went with what appeared to be the most common institutional structure in the country. In addition, in cases where all the available evidence pointed to national party domination of local elections, we assumed that more than 75% of seats were held by these parties, even if detailed data were not available. Those country-years coded “1” on the primary dummy variable are listed in Table 2, and we are very open to feedback by country experts on the accuracy of the coding.

knowledge, this article is the first to consider party system nationalization and party centralization simultaneously in a large empirical model.

Our operationalization of municipal elections is fairly permissive, requiring only that multiparty or competitive non-party elections are held. It is also worth noting that, although our dataset includes information on both regional and municipal institutions, we focus on municipalities (defined as the lowest sub-national authority) in this analysis. We believe that this level of government, in the aggregate, is most likely to matter for the educational and health outcomes that we consider.

Beyond our key theoretical indicators, we control for potentially confounding political factors by including three additional variables, also coded as part of our original dataset. The first of these is *Municipal Plurality*, coded “1” when municipal council elections are held using a plurality (as opposed to a proportional or mixed) electoral system. The second is *Municipal Directly Elected Executive*, coded “1” when municipal executives are directly elected and not removable (except through impeachment or election recall) by the municipal councils. While there is little research on the impact of these institutions at the municipal level, previous research on electoral and executive institutions at the national level indicates that they may matter for public goods outcomes.²⁵ For example, there is reason to believe that strong unitary executives (elected and subject to reasonable legislative oversight) may produce better public outcomes than dominant legislatures (see, for example, Mukherjee 2003; Egger, Koethenbueger and Smart 2010; and Sabatini 2003). And, although this finding is still quite contested, proportional electoral systems may have certain benefits over simple plurality systems (see, for example, Lijphart 1977). Our third political control variable is coded “1” when elections are held at the regional, or highest sub-national, level. Elected government at this intermediate level, when it exists, may have an independent impact on public goods delivery. For all of the political variables, of course, democratically centralized systems are among those coded “0”.

We also include in the model a series of economic and social control variables, namely GDP per capita in purchasing power parity, fertility rate, population density, total population, decade dummies, and, in some

²⁵ For a summary of this literature as it relates to local political institutions, see Hankla and Downs (2010).

cases, world region dummies. Countries with a higher GDP per capita can be expected to have more resources to allocate for education and health. Likewise, countries with lower fertility rates will tend to have more resources to devote to each mother and child. A higher level of population density should also be associated with better educational and health outcomes, as it facilitates access to teachers, school resources, and medical treatment. Finally, municipal institutions may be especially important in countries with greater populations. The data for all of our economic and social indicators are taken from World Bank (2010).

In addition to these variables, we include dummies for each decade in all of the models to account for temporal trends in educational and health outcomes. For the random effects models, we also include dummies for world regions to control for cultural or geographically specific effects, something that is already accounted for in the fixed effects and Arellano-Bond models (see below). And as our theoretical model assumes elections, we also restrict our models to countries that are minimally electorally competitive at the national level, using the *Legislative Index of Electoral Competitiveness* from the Database of Political Institutions (Beck et al. 2001). This index ranges from one to seven, and we only include country-years coded at least a six, indicating that more than one party holds seats in the national legislature. We choose this more expansive definition of electoral competition in preference to a measure of democracy (such as *Polity*) in order to maximize our observations and because we believe that electoral competition but not necessary full-fledged democracy must be present to observe our theorized effects. Summary statistics on all of our variables are presented in Table 1, and a complete listing of all country-years coded “1” on our primary *Democratic Decentralization, Party Centralization* variable is presented in Table 2.

Insert Table 2 here

To ensure the robustness of our empirical tests, we estimate three separate models for each dependent variable. Our primary models use a random effects framework with AR1 autocorrelation correction, decade dummies, and world region dummies. While Hausman tests indicate that our panel effects are not fully random, our indicators of interest vary primarily (though not exclusively) across panels, and so we have chosen random

effects so as not to wash away our most interesting variation. Instead, we seek to control for these panel effects with world region dummies.

In addition, our Fisher tests indicate that, at a minimum, some of the panels for each of our dependent variables are stationary, and in any case the literature counsels against unit root corrections for short panels and for dependent variables that cannot, by their nature, trend indefinitely (see Beck and Katz 2009). For this reason, we make use of an AR1 correction to deal with the autocorrelation present in the model. As noted above, we also include decade dummies to control for any potential time trends in the dependent variables.

To avoid any chance of bias arising from the assumption of random effects, we also estimate fixed effects models as our first robustness test. These models, like those above, make use of decade dummies and an AR1 correction. They are, of course, more robust to omitted variable bias than the random effects models, but they also consider only the less important cross-temporal variation present in our data. Our final robustness tests make use of the Arellano-Bond System Generalized Method of Moments (GMM) estimator (see Roodman 2009). This approach allows us to address any potential reverse causality in the models by instrumenting endogenous variables with their differences and lags.²⁶ It also corrects for panel effects, autocorrelation, and (with robust standard errors) heteroskedasticity. We present the results of our eight primary models in Table 3, of our fixed effects models in Table 4, and of our Arellano-Bond models in Table 5.

Insert Tables 3, 4, and 5 here

5.1 Results

The empirical results provide strong support for our hypotheses. Taking first the primary models in Table 3, the *Democratic Decentralization, Party Centralization* variable is statistically significant in six of the eight estimations and in the expected direction but not significant in the other two. Given that these eight models differ significantly in their dependent variables and in the number and identity of the observations they include, the consistency of the results is quite striking. The *Democratic Decentralization, Party*

²⁶ We identify three variables – *Fertility*, *Logged GDP per capita*, and *Logged Population Density* as potentially endogenous.

Decentralization variable is statistically significant only in the *Children Out of School* model, where its coefficient is much lower than the coefficient of the *Democratic Decentralization, Party Centralization* variable.²⁷ In all of the remaining models, the variable is in the expected direction but not statistically significant. These results support our expectations that combining municipal elections with centralized parties produces the best service delivery outcomes, and that combining municipal elections with decentralized parties is still generally superior to having no democratic decentralization at all (the omitted reference category).²⁸ And the size of these predicted effects is also worthy of consideration. Model 1, for instance, indicates that the combination of democratic decentralization and party centralization causes an increase in primary school enrollment of more than two percent, or a little less than one-tenth of a standard deviation. The effect of this institutional combination on the percentage of children out of school is even greater, reducing it by about one-fifth of a standard deviation.

Moreover, the results are only slightly weaker when rerun using fixed effects and Arellano-Bond. In the fixed effects models, shown in Table 4, the *Democratic Decentralization, Party Centralization* variable is statistically significant in five of the eight estimations, and the *Democratic Decentralization, Party Decentralization* in two (and nearly so in a third). It is worth noting that in two of the five models with significant results (*Children Out of School* and *Primary School Teachers*), there is no evidence that democratically decentralized countries with centralized parties outperform those with decentralized parties.

²⁷ When *Democratic Decentralization, Party Centralization* is statistically significant and *Democratic Decentralization, Party Decentralization* is not, we can be confident that the combination of democratic decentralization and party centralization produces better outcomes than the residual category of no local elections, but that we cannot be sure of the same effect when local elections occur under decentralized parties. Such a finding is clearly supportive of our arguments, but it is distinct from a finding that the effects of *Democratic Decentralization, Party Centralization* and those of *Democratic Decentralization, Party Decentralization* are statistically significantly different from one another. We tested this hypothesis for the models in Table 1 and found that the effects of *Democratic Decentralization, Party Centralization* were indeed significantly greater than those of *Democratic Decentralization, Party Decentralization* in two models (*Primary Enrollment Rate* and *Public Health Expenditures*) and that they were nearly so (between 10% and 20% probability) in two others (*Infant Mortality* and *Children Out of School*).

²⁸ Some readers may wonder about the impact of fiscal decentralization on our models. Might the relationships we identify only matter when local governments have the financial power to deliver public goods? To evaluate this possibility, we estimated the random effects models with only fiscally decentralized countries and years, defined as those observations where both revenue and expenditure decentralization exceeded 10% of total government amounts (as reported in the IMF's Government Financial Statistics). Because this approach severely limited our total observations, due largely to missing data, we did not report these as our primary models. The results are robust for most of the dependent variables, but they do become insignificant for *Primary Enrollment Rate* and *Public Health Expenditures*, and fall to just below the 10% significance mark for *Infant Mortality*. These changes are likely due to the dramatic lowering of the number of observations we are able to include in these models.

Such evidence is, however, present in the remaining three models (*Primary Completion Rate*, *Primary Enrollment Rate*, and *Public Health Expenditures*). It is likely that the slightly weaker results produced by these models result from their focus only on cross-temporal changes in the independent variables of interest.

Finally, in the Arellano-Bond models, shown in Table 5, the *Democratic Decentralization, Party Centralization* variable is statistically significant in seven of the eight estimations, and the *Democratic Decentralization, Party Decentralization* in six. In all but one of these cases, the impact of the *Democratic Decentralization, Party Centralization* variable is greater than that of the *Democratic Decentralization, Party Decentralization* variable, as expected, although the difference is less great than in the primary models. It is also worth noting that we find significant effects for two of the dependent variables, *Primary Ratio of Girls to Boys* and *DPT Immunization*, which were not significant in Tables 3 and 4. Overall, the Arellano-Bond models provide evidence for the hypothesis that local elections and centralized parties are best, but this evidence is somewhat weaker than that found in Table 3. These models do, however, demonstrate clearly the benefits of democratic decentralization relative to the complete absence of local elections.

Does the available evidence support a spending or an efficiency explanation for the superior performance of party centralized, democratically decentralized systems? The presence of local elections is clearly associated both with increased spending on health and with better immunization and infant mortality outcomes. The evidence for the additional benefit of centralized parties is, however, clearer in the spending models (though it also appears in the infant mortality fixed effects model). So, it seems likely that local elections are incentivizing increased public good spending *and* increased efficiency of delivery, and that centralized parties are at a minimum raising spending (though they may also have an efficiency impact). Finally, note that there is strong evidence linking increased spending with best policy outputs in health.

Which control variables matter for educational and health outcomes? Perhaps the most interesting finding is that municipalities with plurality electoral systems tend to provide public service delivery that is inferior to those with proportional or multimember systems. This effect, which is consistent with previous findings related to national-level institutions, is particularly robust with respect to the number of children out of

school and total health expenditures, but it also shows up elsewhere. More surprisingly, there is evidence, albeit much weaker, that systems with directly elected mayors may show inferior performance as well.

Among the economic and social control variables, perhaps the most robust finding is the strong association between low fertility and high GDP per capita on the one hand and positive health and educational outcomes on the other. The only major exception to this rule is the link between per capita income and inferior outcomes that appears in several of the Arellano-Bond models. This surprising finding is likely due to this model's incorporation of a first differences equation; countries that are already rich may see fewer improvements in health or education indicators.

Population density also tends to be associated with positive outcomes, although less universally than low fertility; countries with high density levels are likely to experience greater ease of service delivery than highly ruralized economies. The effects of total population are more mixed and tend to vary with each indicator. Perhaps the most surprising finding among the control variables, however, relates to the regional elections dummy. It is sometimes, though not always, associated with negative outcomes in the random and fixed effects models, and more robustly associated with positive outcomes (as expected) in the Arellano-Bond models. This difference indicates that the variable may be highly correlated with some of the endogenous variables in the GMM model, and that the differential treatment of these variables affects their predicted impact. In any case, the results here are too mixed to draw any definitive conclusions about the impact of regional elections on public goods delivery.

What can we say to summarize the results? The strongest implication of our theoretical model—yielding the strong decentralization theorem—is the welfare dominance of democratic decentralization with party centralization. The benefits of combining democratic decentralization with party centralization are well borne out in our empirical analyses. The *Democratic Decentralization, Party Centralization* variable is statistically significant and in the expected direction in eighteen of the twenty-four models, and it is either stronger or more statistically significant than the *Democratic Decentralization, Party Decentralization* in all but three of these eighteen. While this difference between the two variables is only sometimes statistically significant, it is highly

consistent across a variety of indicators. Given the difficulty of measuring educational and health outcomes, particularly in the developing world, and given the complexity and specificity of local politics in different countries, the robustness of the results provided here is notable. With a reasonable degree of certainty, we therefore conclude that the combination of local elections and national parties is superior for public goods delivery (other things equal), and that the existence of decentralized locally elected government, even when national parties are not present, is in any case superior to a fully centralized system.

6 *Conclusion*

In this paper, we examine which types of political institutions may be necessary to deliver the gains from decentralization predicted by much of the literature. We begin by developing a formal extension and refinement of the decentralization theorem of Oates (1972), which has provided the basis for much past research. In particular, we provide a political economy analysis of the provision of local public goods by incorporating the joint influence of democratic (de)centralization and party (de)centralization. Our theory provides new insights to the theory of fiscal federalism: first, we show that for countries with centralized parties, a system of elected local governments welfare-dominates a centralized structure of government even if local public goods show inter-jurisdictional spillovers. We call this result the “strong decentralization theorem”. Indeed, an important implication of our theoretical model is that the combination of democratic decentralization and party centralization tends to produce the most efficient provision of public goods. Democratic decentralization ensures that local governments are responsive to the desires of their constituents, while party centralization incentivizes local leaders to pay for goods that may have spillover benefits.

Second, we show that, for countries with decentralized parties, the strong decentralization theorem does not hold. In other words, we demonstrate that creating locally elected governments can only be expected to improve public goods allocation either when parties are centralized or when there are no inter-jurisdictional spillovers. Local governments controlled by decentralized parties are not likely to provide public goods that

spill over into adjacent constituencies. To summarize, then, our theory points to the importance of political institutions in determining how efficient fiscal decentralization outcomes actually are.

To test our argument empirically, we create a large dataset on sub-national political institutions and use it to estimate a series of cross-national empirical analysis of educational and health outcomes. Our dataset is, to our knowledge, the first to compile measures of sub-national political institutions across a large set of countries. Our empirical findings provide strong support for our hypothesis. They show that the combination of municipal elections and party centralization tends to produce the best educational and health outcomes.

Our ultimate goal in this paper is to understand better how the growing prevalence of decentralization, mitigated by the structure of local political institutions, may impact the everyday lives of citizens around the world. We find that political institutions, which are typically ignored in the economics literature on fiscal decentralization that begins with Oates' (1972) decentralization theorem, may significantly influence the efficiency of decentralized systems. Our results also show the potential of merging political science and economics into broader approaches to explore the inter-connected dynamics of decentralized governance.

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Table 1: Summary Statistics

Variable	Computation Method and Source	Mean	Range	Expectations
Primary School Completion Rate	The ratio of total primary school graduates to the total population of relevant age. (Source: World Bank)	81.7	10.0 to 125	Dependent Variable
Children Out of School	The ratio of primary aged children not enrolled in school to the total population under age 14. (Source: World Bank)	4.36	0 to 29.4	Dependent Variable
Primary School Teachers	The ratio of primary school teachers to the total population under age 14. (Source: World Bank)	1.60	.113 to 4.34	Dependent Variable
Primary School Enrollment	The ratio of total enrollment in primary school, regardless of age, to the total population of primary school age. (Source: World Bank)	99.3	17.9 to 158	Dependent Variable
Primary School Ratio of Girls to Boys	The ratio of girls to boys enrolled in primary school. (Source: World Bank)	95.6	48.3 to 122	Dependent Variable
Children Receiving DPT Immunizations	The percentage of children aged 12 to 24 months who have received adequate DPT vaccination. (Source: World Bank)	79.3	1 to 99	Dependent Variable
Public Health Expenditure	Total public expenditure on health as a percentage of GDP (Source: World Bank)	3.46	0 to 14.1	Dependent Variable
Infant Mortality	Number of infants dying before one year of age per 1000 live births (Source: World Bank)	38.2	2.2 to 154	Dependent Variable
Democratic Decentralization, Party Centralization (Lagged)	Coded “1” when (1) there are municipal elections, and (2) more than 75% of municipal council seats are held by national parties, and (3) national party leaders control party nomination in municipal elections. (Source: Original Dataset)	.456	Dummy	Positive (but the sign for this and all variables below should be reversed for Children Out of School and Infant Mortality)
Democratic Decentralization, Party Decentralization (Lagged)	Coded “1” when (1) there are municipal elections, and either (2) 75% or fewer of municipal council seats are held by national parties, or (3) national party leaders do not control party nomination in municipal elections. (Source: Original Dataset)	.303	Dummy	Insignificant or Positive with a smaller sign than Democratic Decentralization, Party Centralization
Municipal Plurality (Lagged)	Coded “1” when (1) there are municipal elections, and (2) a plurality system is used to elect the municipal assembly. (Source: Original Dataset)	.241	Dummy	Uncertain (Negative?)
Municipal Directly Elected Executive (Lagged)	Coded “1” when (1) there are municipal elections, and (2) the municipal mayor or other executive is directly elected and cannot be removed by the municipal council. (Source: Original Dataset)	.309	Dummy	Uncertain (Positive?)
Fertility (Lagged)	Lagged average births per woman (Source: World Bank)	3.29	1.08 to 7.74	Negative
Logged GDP per capita (Lagged)	Lagged Logged GDP per capita ppp (Source: World Bank)	8.59	5.71 to 10.8	Positive
Logged Population Density (Lagged)	Lagged logged people per square kilometer (Source: World Bank)	4.00	.366 to 8.76	Positive
Regional Elections (Lagged)	Coded “1” when competitive elections are held at the regional level (Source: Original Dataset)	.437	Dummy	Uncertain (Positive?)
Logged Population (Lagged)	Lagged logged total population (Source: World Bank)	16.1	12.3 to 20.8	Uncertain
Legislative Electoral Competitiveness (Lagged)	Lagged Legislative Index of Electoral Competitiveness (Source: Database of Political Institutions)	N/A	1 to 7	Used to restrict dataset to countries with multiple parties in the national legislature (scoring 6 or 7)

Table 2: Countries Coded “1” on Democratic Decentralization, Party Centralization

(Note: Only electorally competitive country-years included; coded “1” for 1975-2006 unless otherwise stated)

Albania (1992-2006), Argentina (1975, 1984-2006), Austria, Azerbaijan (2000-2006), Benin (2002-2006), Bolivia (1995-2006), Bosnia (2003-2006), Botswana, Bulgaria (1991-2006), Burkina Faso (1995-2006), Burundi (2005-2006), Cambodia (2002-2006), Cameroon (1996-2006), Republic of Congo (1994-1997, 2003-2006), Costa Rica, Croatia (1993-2006), Denmark, Dominican Republic, Ecuador (1980-96), Egypt (1996-2006), El Salvador (1983-2006), Equatorial Guinea (2000-2006), Estonia (1993-2006), Fiji (1975-1987, 1994-1997), Finland, France, Gabon (1997-2006), Gambia (1975-1994, 1997-2006), Georgia (1993-1994, 1998-2006), Greece, Guatemala (1995-2006), Guinea (2005-2006), Guyana (1994-2006), Haiti (1991, 1995-1997, 2001-2003, 2006), Honduras (1982-2006), Hungary (1991-2006), Israel, Italy, Ivory Coast (2001-2006), Jamaica (1975-1983, 1987-2006), South Korea (1995-2006), Latvia (1994-2006), Lebanon (1998-2006), Lesotho (2005-2006), Lithuania (1995-2006), Macedonia (1996-2006), Madagascar (1995-2006), Malawi (2000-2005), Mali (1993-2006), Mexico, Moldova (1995-2006), Mongolia (2001-2006), Morocco (1997-2006), Mozambique (1998-2006), Namibia (1992-2006), Nepal (1992-2001), Nicaragua (1990-2006), Niger (2004-2006), Panama (1985-2006), Paraguay (1991-2006), Peru (1981-2006), Portugal (1977-2006), Romania (1992-2006), Russia (2000-2006), Senegal (1990-2006), Sierra Leone (2004-2006), Slovak Republic (1993-2006), Slovenia (1994-2006), Spain (1979-2006), Sri Lanka (1975-1990), Sweden, Taiwan (1993-2006), Tanzania (1996-2006), Thailand (1976, 1980-2006), Trinidad, Tunisia (1995-2006), Ukraine (1998-2006), United Kingdom, Uzbekistan (2000-2006), Venezuela, Yemen (2001-2006), Yugoslavia (1993-2001), Zambia (1992-2006), Zimbabwe (1984-2006)

Table 3: Results of the Primary Models
(Random Effects Models with AR1 Correction, World Region Dummies, and Decade Dummies)

Variable	Model 1	Model 2	Model 3	Model 4	Model 5		Model 6	Model 7	Model 8
	Y= Primary Completion Rate (N=1548, 128 countries)	Y= Children Out of School (N=1522, 128 countries)	Y= Primary School Teachers (N=1746, 133 countries)	Y= Primary Enrollment Rate (N=2237, 135 countries)	Y= Ratio of Girls to Boys in Primary School (N=1843, 133 countries)		Y=DPT Immunizations (N=1506, 135 countries)	Y=Infant Mortality (N=1507, 135 countries)	Y=Public Health Expenditures (N=1617, 135 countries)
							Efficiency Model	Efficiency Model	Spending Model
Democratic Decentralization, Party Centralization (Lagged)	2.02** (.972)	-1.13*** (.254)	.037* (.021)	2.67*** (.666)	.258 (.333)		1.20 (1.08)	-.668** (.285)	.253*** (.082)
Democratic Decentralization, Party Decentralization (Lagged)	.677 (1.29)	-.619* (.339)	.036 (.029)	.414 (.858)	.040 (.457)		.019 (1.43)	-.172 (.402)	.040 (.119)
Municipal Plurality (Lagged)	1.31 (1.16)	.753** (.299)	-.019 (.026)	-.079 (.793)	-.104 (.415)		1.20 (1.14)	.204 (.312)	-.193** (.096)
Municipal Directly Elected Executive (Lagged)	-1.98** (1.00)	.318 (.273)	-.010 (.023)	.078 (.728)	-.625* (.376)		-.969 (1.14)	.264 (.331)	-.085 (.094)
Fertility (Lagged)	-8.55*** (.719)	1.91*** (.202)	-.148*** (.020)	-5.04*** (.631)	-4.09*** (.333)		-9.01*** (.834)	10.2*** (.417)	-.155* (.084)
Logged GDP per capita (Lagged)	4.75*** (1.08)	-1.05*** (.300)	.319*** (.032)	3.14*** (1.02)	1.34** (.536)		-2.24** (.934)	-7.04*** (.500)	.323*** (.102)
Logged Population Density (Lagged)	.964 (.871)	-.228 (.239)	.017 (.032)	3.27*** (1.04)	.623 (.565)		1.56** (.690)	-5.34*** (.752)	-.116 (.093)
Regional Elections (Lagged)	-.788 (.988)	.652*** (.243)	-.022 (.019)	-1.82*** (.629)	-.414 (.344)		.074 (1.05)	-.238 (.283)	.064 (.087)
Logged Population (Lagged)	.094 (.745)	-.282 (.208)	-.018 (.028)	.772 (.902)	-.580 (.487)		-.101 (.628)	-1.54** (.680)	-.015 (.083)
Public Health Expenditure (Lagged)							1.13*** (.287)	-.342*** (.079)	
R ²	.713	.648	.637	.290	.531		.567	.862	.479

***p<.01, **p<.05, *p<.10, ^ap<.20. All tests are 2-tailed. Standard errors are in parenthesis.

Table 4: Results of the First Robustness Checks
(Fixed Effects Models with AR1 Correction and Decade Dummies)

Variable	Model 1	Model 2	Model 3	Model 4	Model 5		Model 6	Model 7	Model 8
	Y= Primary Completi on Rate (N=1420, 122 countries)	Y= Children Out of School (N=1394, 119 countries)	Y= Primary School Teachers (N=1613, 129 countries)	Y= Primary Enroll- ment Rate (N=2102, 133 countries)	Y= Ratio of Girls to Boys in Primary School (N=1710, 128 countries)		Y=DPT Immun- izations (N=1371, 135 countries) Efficiency Model	Y=Infant Mortality (N=1372, 135 countries) Efficiency Model	Y=Public Health Expend- itures (N=1482, 135 countries) Spending Model
Democratic Decentralization, Party Centralization (Lagged)	1.82* (1.08)	-.650** (.255)	.037* (.021)	1.99*** (.633)	-.244 (.301)		.609 (1.30)	-.186 (.148)	.262*** (.089)
Democratic Decentralization, Party Decentralization (Lagged)	1.96 ^a (1.47)	-.741** (.354)	.054* (.030)	.743 (.819)	.039 (.412)		.729 (1.87)	.066 (.213)	.001 (.136)
Municipal Plurality (Lagged)	1.07 (1.29)	.731** (.305)	-.028 (.026)	.319 (.744)	-.027 (.370)		.865 (1.42)	.056 (.163)	-.159 ^a (.104)
Municipal Directly Elected Executive (Lagged)	-.351 (1.15)	.114 (.287)	-.023 (.024)	.299 (.702)	-.403 (.343)		-.976 (1.54)	.112 (.174)	-.071 (.108)
Fertility (Lagged)	-6.61*** (1.05)	1.85*** (.314)	-.095*** (.035)	-4.29*** (1.02)	-2.38*** (.535)		-9.62*** (1.75)	1.22*** (.430)	-.279** (.138)
Logged GDP per capita (Lagged)	7.30*** (1.43)	-.871* (.468)	.334*** (.040)	6.61*** (1.30)	1.26** (.637)		1.52 (2.15)	-2.01*** (.400)	.634*** (.173)
Logged Population Density (Lagged)	-2.67 ^a (1.89)	-.736 (.663)	.045 (.065)	.402 (2.47)	1.73 (1.39)		5.32 (4.35)	-7.19*** (2.03)	.088 (.361)
Regional Elections (Lagged)	-1.25 (1.12)	.426* (.239)	-.021 (.020)	-2.02*** (.594)	-.154 (.307)		-1.48 (1.28)	-.091 (.147)	.043 (.094)
Logged Population (Lagged)	3.21*** (.972)	.625* (.334)	-.071** (.029)	3.33*** (1.02)	5.09 (.524)		4.80*** (1.70)	4.59*** (.565)	-.109 (.138)
Public Health Expenditure (Lagged)							.517 (.366)	-.051 (.042)	
R ²	.611	.496	.607	.162	.056		.428	.233	.346

***p<.01, **p<.05, *p<.10, ^ap<.20. All tests are 2-tailed. Standard errors are in parenthesis

Table 5: Results of the Second Robustness Checks
(Arellano-Bond System GMM Models with Robust Standard Errors and Decade Dummies)

Variable	Model 1	Model 2	Model 3	Model 4	Model 5		Model 6	Model 7	Model 8
	Y= Primary Completion Rate (N=1303, 120 countries)	Y= Children Out of School (N=1303, 117 countries)	Y= Primary School Teachers (N=1533, 130 countries)	Y= Primary Enrollment Rate (N=2103, 133 countries)	Y= Ratio of Girls to Boys in Primary School (N=1647, 127 countries)		Y=DPT Immunizations (N=1504, 135 countries) Efficiency Model	Y=Infant Mortality (N=1507, 135 countries) Efficiency Model	Y=Public Health Expenditures (N=1507, 135 countries) Spending Model
Democratic Decentralization, Party Centralization (Lagged)	2.41*** (.907)	-.770*** (.279)	.003 (.009)	3.58*** (.915)	1.02*** (.312)		3.86*** (1.45)	-.853*** (.283)	.162** (.066)
Democratic Decentralization, Party Decentralization (Lagged)	1.99* (1.08)	-.716** (.288)	-.009 (.012)	3.10*** (1.07)	.893*** (.330)		3.03* (1.75)	-.938*** (.314)	.140* (.080)
Municipal Plurality (Lagged)	-.076 (.875)	.117 (.110)	-.004 (.006)	-2.19*** (.809)	-.343* (.198)		-.085 (1.04)	.166 (.167)	-.058 ^a (.042)
Municipal Directly Elected Executive (Lagged)	-.552 (.540)	.046 (.099)	-.001 (.007)	.248 (.579)	-.171 (.155)		-.994 (.909)	.030 (.147)	-.022 (.042)
Fertility (Lagged)	-2.18*** (.742)	.339** (.136)	-.007 ^a (.005)	-.516 (.454)	-.229 (.200)		-4.52*** (.718)	.410*** (.138)	.131*** (.042)
Logged GDP per capita (Lagged)	-1.37** (.582)	.283** (.129)	.023 ^a (.014)	-1.65*** (.614)	-.103 (.215)		-4.95*** (.982)	.700*** (.146)	.238*** (.074)
Logged Population Density (Lagged)	-.061 (.293)	-.030 (.035)	-.003 (.003)	.071 (.250)	.014 (.074)		.724* (.432)	-.121* (.068)	.014 (.024)
Regional Elections (Lagged)	.908 ^a (.612)	-.225** (.114)	-.004 (.010)	1.06* (.599)	.259 ^a (.180)		.830 (.975)	-.174 (.156)	.073* (.041)
Logged Population (Lagged)	.170 (.209)	-.038 (.052)	.001 (.003)	.136 (.235)	-.155** (.073)		.007 (.360)	-.025 (.054)	-.017 (.018)
Public Health Expenditure (Lagged)							1.75*** (.531)	-.127 ^a (.081)	

***p<.01, **p<.05, *p<.10, ^ap<.20. All tests are 2-tailed. Robust standard errors are in parenthesis